FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Flight.

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EDITORIAL COMMENT.

Propeller Vibration in Flight.

We draw our readers' special attention to a letter from Mr. J. W. Cloud, who is the Chief Engineer in England to the Westinghouse Brake Co. Mr. Cloud has long been one of those who regards the gyroscopic couple of the rotating propeller and rotating engine as a serious factor in the control of aeroplanes. He bases his belief on the assumption that the slight angular disturbances to which the longitudinal axis of the aeroplane is likely to be subjected on a gusty day, are far more rapid than those corresponding to quick turns in the air for which times have been taken and on which the gyroscopic couple has hitherto been calculated.

It will be remembered that this matter of the gyroscopic couple has frequently been raised in these columns by various readers. It was raised also before the Departmental Committee appointed to investigate the accidents to the Army monoplanes. In the report of that Committee will be found a reference to the matter in which it is shown that, on the basis of a quick turn in the air, the effect of the gyroscopic couple, regarded as an increase in load on the tail, is not of a magnitude greater than, or even as great as, would be likely to be caused by the direct action of a gust. Moreover, being definite in direction and amount, and coming at an appointed time, the pilot is in a far better position to counteract its effect.

For a 100 h.p. Gnome engine and propeller the gyroscopic couple is in the order of 330 lb. ft. The value is approximately the same whether the conditions be those of a quick turn or the beginning of a quick dive.

This value seems to be a very considerable quantity, but if its disturbing influence on the control were anything like as great as its numerical significance would suggest at first sight, it is surely remarkable that the matter has not been brought to a head by pilots themselves. Further than that, it would be extraordinary that pilots could do what they now accomplish were they not readily able to counteract this influence, for it is not a chance force that comes sometimes and is absent on others; it is definite, and it is sure.

When regarded as an increase of load on the tail to be counteracted by the rudder or the elevator, as the case may be, its numerical importance is seen to diminish appreciably. Thus for an organ of control, situated 10 feet from the centre of gravity of the machine, we have a force of 33 lbs., and if the control organ has 10 sq. ft. of effective area, the loading required to counteract this force is less than $3\frac{1}{2}$ lbs. per sq. ft.

Both from the practical and the mathematical aspects of this particular problem, it would seem that there is no reason to take alarm at the forces in question, although there is undoubtedly every reason for the pilot to appreciate their existence, to understand their nature and amount, and to practise in the art of their control. If they were absent or neutralised it would be so much the better, of course, just as it would be desirable to eliminate the possibility of skidding from the driving of a motor car.

Two propellers rotating in opposite directions is the proper solution, but the constructional convenience of a single propeller on certain types of aeroplane, and the undeniable service that has been accomplished by the rotary Gnome constitute, to say the least of it, a justification for allowing the existence of the force in question, while the practical accomplishments of pilots afford a further justification for having permitted it to remain up to the present time.

The absence of numerical data renders it impossible to theorise quantitatively on the possible influence of the gyroscopic couple caused by sudden, although slight, disturbances of the axis of the machine in nominally straight flight. It is, of course, a fact that the couple

does not depend upon the amount of the angular displacement, but upon the suddenness of the acceleration or precessional movement. The movement itself may be very slight in amount, but if it is sufficiently rapid it will bring a large couple into play. In the absence of actual figures, we can only rely upon the experiences of pilots, and up to the present time we have not heard complaints in this direction. If any pilots who have flown much in windy weather have experienced sudden twistings of their machines in the horizontal plane, accompanying sudden pitchings in the vertical plane, and *vice versa*, we should be very pleased to hear from them, and have their own accounts of the effects of such disturbances on the control.

There is, however, an aspect of the subject dealt with in Mr. Cloud's letter to which we attach sufficient importance to commend the matter to the attention of aeroplane constructors. It is perfectly obvious that the vibration effect of a two-bladed propeller is a variable quantity during each revolution. Regarding the couple introduced by pitching, for example, the effect is a maximum if the pitching originates while the propeller is vertical, and is zero if the propeller is at that moment horizontal. Expressed in another way, we may say that if the machine oscillates about its wing spar in flight, then the two-bladed propeller will maintain a perpetual vibration owing to the difference in magnitude of the vibration couple. This vibration is of course quite distinct from the gyroscopic couple itself, being due only to the variation of the moment of the mass about the axis of forced precession.

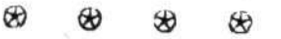
We believe that this aspect of the case has always been quite well known and appreciated by constructors and others, but we have no knowledge of any precise experimental evidence showing whether or no it is a serious factor in practice. It is commonly supposed, we believe, to be of no particular consequence; at any rate, the two-bladed propeller has never been seriously criticised on these grounds, so far as we are aware.

For our own part, we are by no means anxious to raise false estimates of systems that are serving their purpose well, but we must confess to having been much impressed by a very simple experiment that was made for us by Mr. Cloud at the Westinghouse works. He had a little electric motor balanced on a trunnion so that it could be oscillated in any direction. On the motor spindle could be placed metal bars to represent two, three, and four-bladed propellers. The difference in the vibration caused by the two and the four-bladed propeller, in favour of the four-bladed propeller, when the axis of the motor was oscillated, was so remarkable that we would certainly recommend those interested to look into the matter for themselves.

We do not say more than this because we cannot offer any conclusive evidence that the experiment in any way represented the conditions of flight to scale. We merely record the fact that the difference in the effect—which could be felt by the hand when oscillating the motor, and was therefore to that extent all the more definitely impressed on the mind—between the two and the four-bladed propeller was very much greater than we had previously imagined, and it may be that in actual fact the advantage of the four-bladed propeller under this head is in practical flight superior to what is generally supposed.

The vibration due to the two-bladed rotating member in the experiment was exceptionally harsh and unpleasant, the whole frame being subjected to thuds of distinct violence and suddenness. With the three-bladed propeller, the vibration was still noticeable, but its violence was appreciably diminished. It had, as one might say mathematically, taken unto itself the characteristic of a curve. With the four-bladed rotating member, the vibration was, by comparison, so slight as to be negligible. It will be understood, as we have already remarked, that the above considerations do not relate to the gyroscopic couple as a whole. In fact the couple as such was greatest in the case of the four-bladed member, as it had the greatest mass, the same diameter, and was rotating at the same speed.

Reverting for a moment to the subject of twin propellers rotating in opposite directions, when there are two twin-bladed propellers they should become vertical together and horizontal together. This is an important condition if they are to neutralise their individual gyroscopic effects. We mention the matter here because there is an Italian horizontal engine very ingeniously designed to drive a propeller at each end. The centres being rather close together, space for the rotation of the twin screws is obtained by placing one horizontal while the other is vertical. Thus, as long as the tip of one propeller clears the boss of the other, they can rotate without running foul of each other.



THE CORKSCREW TWIST.

IT is difficult from the accounts that have been published of the extraordinary experiment made by M. Pegoud on a Blériot monoplane in France on Monday to really grasp exactly what it was that the pilot did. The salient point in the descriptions is that for a distance of about 400 yards his machine was upside down and still under control.

It is definitely stated also that it was not a case of looping the loop. We imagine, however, that the exhibition was in principle related to a performance of this order: that is to say, we suppose that during the inverted flight of the machine the wing pressure was operating against centrifugal force.

What we suppose took place was this. The pilot made a dive of exceptional steepness, and having acquired a velocity considerably above his normal flight speed, he proceeded to flatten out. It has been demonstrated by Lanchester and others that a model thus launched can successfully loop the loop, that is to say, the momentum of its descent is used to carry it round the rising half of the circle, and beyond, while the wing pressure counteracts centrifugal force and so steers the machine of its circular path.

If, at the bottom of the dive, when having flattened out, the upward curve of the loop is about to be commenced, the control is so used as to roll the machine into an inverted position, what would otherwise have been the top half of the circle completing the loop will now become a curve proceeding away from the origin of the loop; that is to say, instead of the two semi-circles forming one circle they will be drawn consecutively in the same direction, the first one convex to the earth, the second one concave.

To call this second curve a semi-circle is, of course, incorrect, because while the machine is turning over, it will steer off to one side as if it were performing an

THE ROUND BRITAIN WATERPLANE RACE.

THE ALL-BRITISH COMBINATION.

ordinary turn, and by the time it is upside down the machine will probably be no higher in altitude than formerly.

In regaining its upright position it would steer off in another direction, and so the line of flight would make a kind of "S" curve in the air, if the controls were used to make the machine perform one complete corkscrew twist.

Whether this is what happened or not we cannot say for certain, because the accounts in the Press are extremely confusing. All agree that the machine was upside down, and while some describe it as looping the loop, others say quite definitely that the machine made nothing like a loop. One significant point that is reported is a remark by the pilot to the effect that he would be quite prepared to do the "stunt" again without the special braces that he used to strap him to his seat.

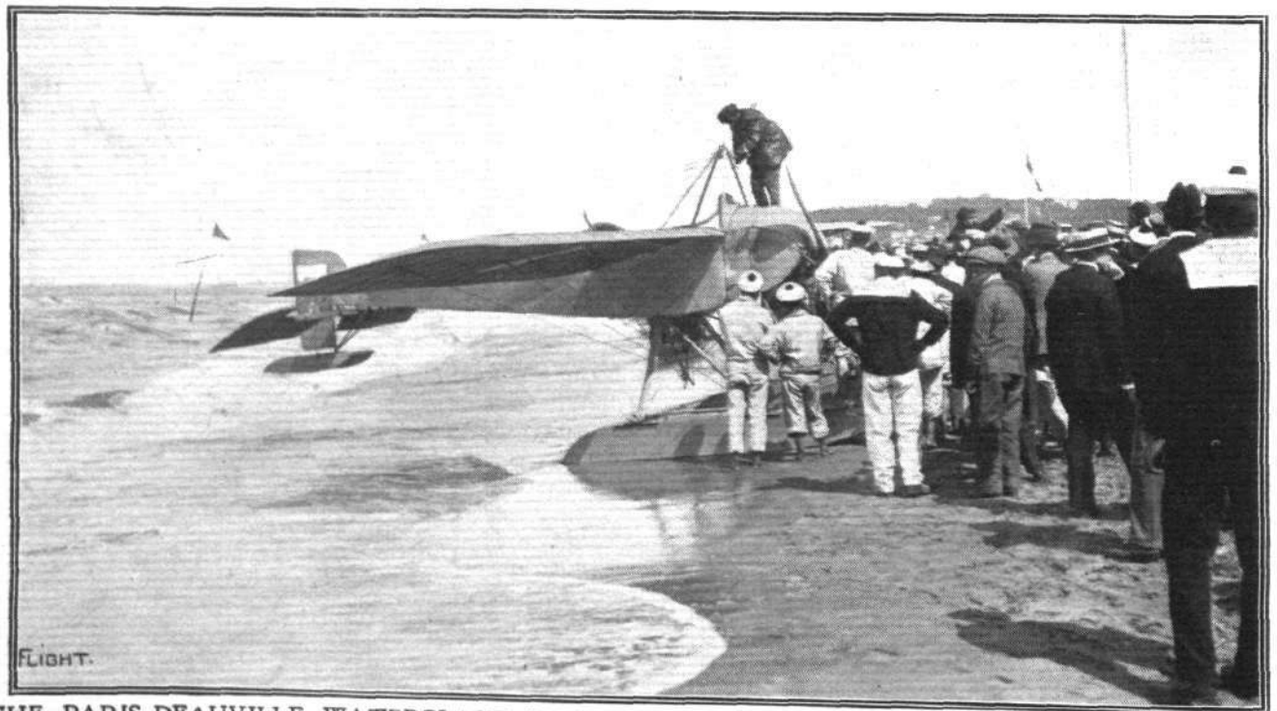
Now, if the pilot felt no sensation of falling off his seat when he was upside down in the air, it is quite clear that he must have been sustained in position by centrifugal force, and it is equally clear that the aeroplane must have been subjected to the same force. It is evident, therefore, that the air-pressure was in the usual relative direction to the wings; that is to say, the lift wires from the under-carriage to the spars were still taking the load while the machine was upside down.

This is very important, because a great deal of fuss is being made in the Press to the effect that the performance represents a wonderful stride in the direction of safety, and the general impression that is likely to be conveyed by the articles that we have read is such that a man might almost think he could take a Blériot monoplane and fool about with it in the air with impunity. We all know that the Blériot machines are excellent, and we are quite certain that those associated with the business of selling them would not wish to be party to the propagation of any such mischievous idea.

From the accounts before us we see nothing in the performance of M. Pegoud other than a sensational stunt of an uncommonly daring order. A minority of individuals in the world are so constituted physically and mentally as to feel perfectly comfortable in positions that are commonly obnoxious to the human being, although frequently assumed by some other members of the animal kingdom. M. Pegoud is apparently one of them; at any rate, he smiles at the prospect of a performance that would make any ordinary being undeniably scared.

We do not in the least wish to discount the value of a performance like this when viewed from the standpoint of putting the structure of an aeroplane to a direct practical test. It is recognised in aviation that, in the limit, safety lies in having sufficient head-room in which to acquire velocity, and that in emergency a pilot may subject his machine to stresses far above the normal as a consequence of straightening out at such a very high velocity thus acquired. To have a man in one's employ who is willing and indeed anxious to put a machine to a practical test under such conditions, and to embellish the performance with a few tricks on his own account, may perhaps be regarded as a blessing, but the desire to embellish it with tricks on his own account must in some respects cause the blessing to be not altogether unmixed.

One reason why we deal with this matter at length is because we have on record one definite instance of a machine having been accidentally turned upside down in mid-air, and of having glided to earth on a zigzag path while thus inverted. The mishap occurred to Capt. H. R. P. Reynolds of the Royal Flying Corps while flying from Oxford towards Cambridge. His own account of it is given on page 411 of the current volume of FLIGHT. The machine he was flying was a Bristol biplane. A similar experience is recorded as having happened to Capt. Aubry of the French Army while flying a Deperdussin monoplane, but as we only have the newspaper report of that accident we do not vouch for the truth of the details. The experience of Capt. Reynolds, is however, quite definite, and it is an instance in which, so far as it was possible for a machine to save its pilot under such circumstances, this aeroplane in fact did so.

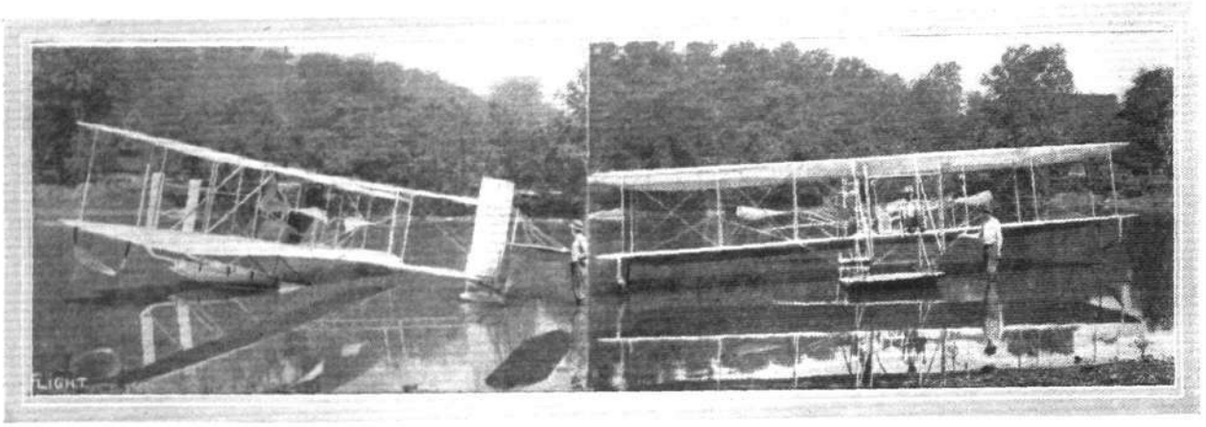


THE PARIS-DEAUVILLE WATERPLANE RACE.—Chemet and his Borel machine immediately after arrival at the control on the beach at Deauville.

M. A. Debussy on the Breguet, overtaking Carr (below), on the Grahame-White biplane, in a speed handicap at Hendon.

THE MODEL "C.H." WRIGHT WATERPLANE.

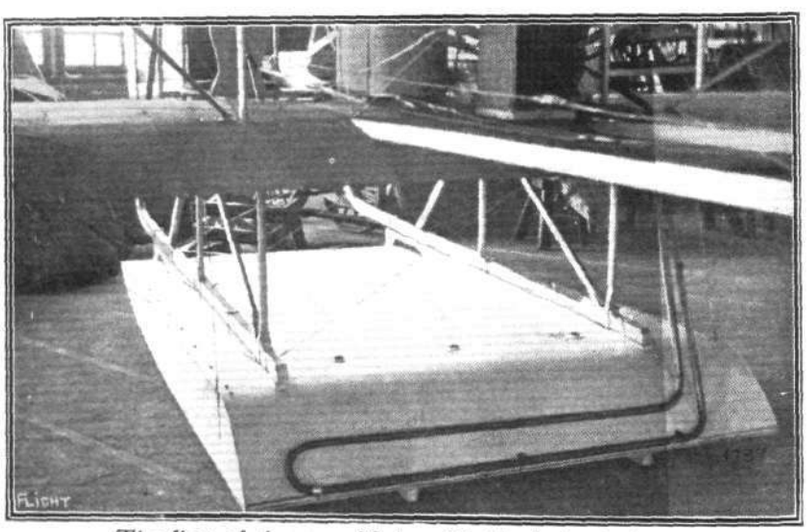
IN the United States the development of the waterplane has followed somewhat different lines from those pursued over here, owing, no doubt, mainly to the geographical differences between the two countries. A waterplane intended for use on inland lakes and rivers, or even "creeks," as the smaller rivers in the States are called, should obviously be differently designed from one whose field of operation is the coast or open sea. Whilst in this country and on the continent waterplanes with single floats are comparatively few, this type of craft seems to be the more popular in America.



Two views of the new Wright hydro-biplane on the Miami River, Orville Wright being seen in the pilot's seat.

The waterplane illustrated in this issue has been designed for use on small lakes, and is of special interest on account of the fact that it has been evolved at the Wright works, at Dayton, Ohio. With the exception of a few alterations this machine is exactly similar to the well-known standard-type Wright biplane. Two alterations will be noticed at once on inspection of the accompanying scale drawings, *i.e.* the extension of the rudders above the tail booms and the new position of the blinkers, which, in the standard-type machine are of triangular shape, and placed between the skid and the front down corner strut. Both alterations have doubtless been made with a view to neutralising the effect of the side area of the float. This member, it will be seen, is of comparatively great width, and is of the plain or non-stepped type. Great care has been exercised in determining the shape of the float, and the result has evidently repaid the time and money spent in evolving it, for we are told that it gets off the water in 10 secs, a performance which is little short of marvellous, but it must be admitted that it was under the expert handling of Mr. Orville Wright that this was achieved, a fact which no doubt was contributory to the excellent "get-off."

That the machine not only is quick in rising but also a good weight carrier is proved by the fact that on one occasion Mr. Wright carried three passengers besides a considerable amount of fuel, so that the load carried must have been in the vicinity of 800 lbs. The test flights were made on the Miami River, which is very narrow, and on both sides the banks are very high and covered with trees, so that it will be understood that it was by no means an ideal place for testing a new machine. Mr. Wright, however, was of the opinion that it represented the average conditions that would have to be met if the machine is to be of any use for the purpose for which it was designed—the navigation of small lakes and shallow streams, inaccessible for other types of aircraft.



The float of the new 60 h.p. Wright hydro-biplane.

The weight of the machine empty is 920 lbs. without the float, the weight of which is 240 lbs. The power plant consists of one of the new Wright 6-cyl. 60 h.p. water-cooled engines, driving through a chain and sprocket reduction gear two propellers of 8 ft. 6 in. diameter.

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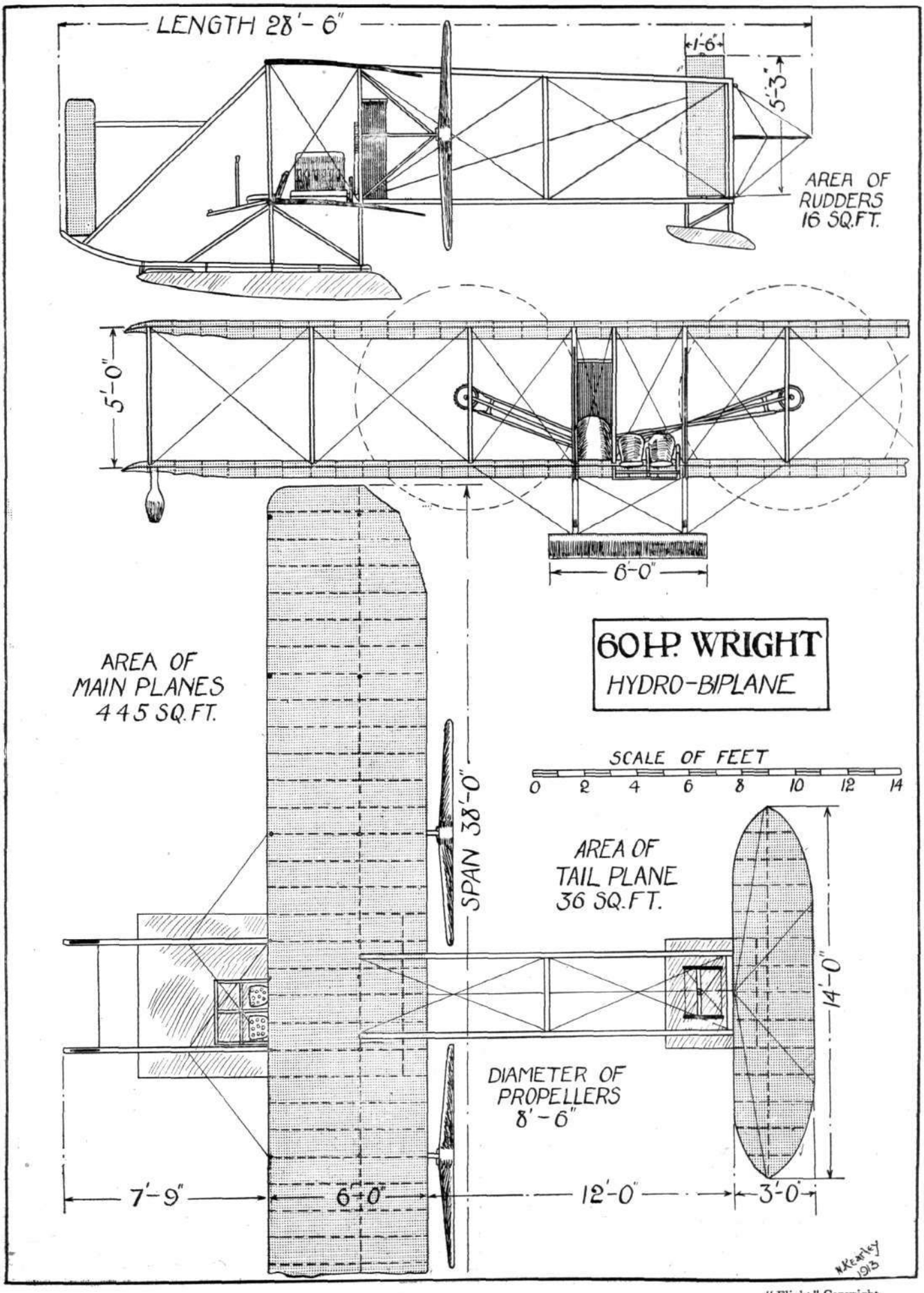
Learning to Fly.

IN "The Airman" Capt. C. Mellor, R.E., has given us a diary of a pupil at one of the French flying schools—the Farman school at Etampes, as a matter of fact—and besides making a very interesting little book, it is one which those who are thinking of taking up the art would do well to study. In simple, untechnical language it sets forth the experiences of the pupil during his lessons, explaining where and how he made his mistakes, how he eventually achieved his ambition and secured his *brevet*, and how he taught himself the *vol plané*. The book has a foreword by Mr. Maurice Farman, and there are eight photographic illustrations.—(*John Lane*. 3*s*. 6*d*. net.)



THE 60 H.P. WRIGHT HYDRO-BIPLANE.—Plan, side and front elevations to scale.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 2nd inst., when there were present: Col. H. C. L. Holden, C.B., F.R.S. (in the Chair), Mr. Griffith Brewer, Mr. G. B. Cockburn, Mr. J. T. C. Moore-Brabazon, Mr. C. F. Pollock, Mr. T. O. M. Sopwith, and the Secretary.

The Late Mr. S. F. Cody.

Col. H. C. L. Holden, on taking the Chair, stated that it was the first time the Committee had met since the sad accident to Mr. S. F. Cody; he, therefore, proposed that the following resolution should be sent to the relatives of the late Mr. S. F. Cody:—

"The members of the Royal Aero Club deeply regret the untimely death of Mr. S. F. Cody from an accident when flying, and desire to express their deepest sympathy with his widow, sons and relatives. They desire at the same time to place on record their appreciation of the late Mr. Cody's pluck, perseverance straightforwardness, good nature and other qualities which endeared him to all those with whom he was brought into contact. The ranks of aviators have sustained a loss which it will be impossible to replace."

This Resolution was unanimously agreed to.

***Daily Mail* £5,000 Prize.**—On the proposition of the Chairman, it was unanimously resolved to convey the congratulations of the Club to Mr. T. O. M. Sopwith and Mr. H. G. Hawker on their magnificent attempt to win the *Daily Mail* £5,000 Prize.

It was further resolved to award the silver medal of the Club to Mr. H. G. Hawker, the pilot, and the bronze medal of the Club to Mr. H. Kauper, his passenger, as an appreciation of their magnificent flight in this competition.

It was unanimously resolved that the thanks of the Club be conveyed to the Admiralty and War Office for the assistance rendered by them in connection with the Race.

Votes of thanks were also passed to the Officials who kindly assisted at the various controls, and to the following Yacht Clubs who placed their premises at the disposal of the Officials:—

Royal Temple Yacht Club, Ramsgate.
Royal St. George Yacht Club, Kingstown.
Royal Cornwall Yacht Club, Falmouth.

A further vote of thanks was unanimously passed to the Royal Motor Yacht Club for kindly placing their Headquarters, the "Enchantress," at the disposal of the Club, and also for electing Members of the Royal Aero Club Honorary Members of the Royal Motor Yacht Club for the period covered by the Race.

Election of Members.—The following new Members were elected:—Lieut. Denis W. Boyd, R.N.; Lieut. William R. Crocker, R.N.; William John Holland Hall; A. Stroud Haxton; Lieut. Nevile M. Jenkins, R.A.; Hector William McJannet; Eng. Com. H. J. Meiklejohn, R.N.; Lieut. Sir A. H. M. Sinclair, Bart.; Robert Stevenson; Capt. Disney Y. Watt; Lieut. Lord George Wellesley.

Certificates.—The following Certificates were granted:—

578 S. J. V. Fill (E.A.C. Biplane, Eastbourne Aviation School, Eastbourne), Aug. 3rd, 1913.
579 1st Class Air-Mechanic William Smith (Maurice Farman Biplane, Central Flying School, Upavon), Aug. 5th, 1913.
580 1st Class Air-Mechanic Frederick Dismore (Short Biplane, Central Flying School, Upavon), Aug. 5th, 1913.
581 Frank Myles Temple Reilly (Blériot Monoplane, Blériot School, Hendon), Aug. 5th, 1913.
582 Engine Room Artificer P. H. McCartan (Maurice Farman Biplane, Central Flying School, Upavon), Aug. 6th, 1913.
583 Sergt.-Major Albert Levick (Short Biplane, Central Flying School, Upavon), Aug. 8th, 1913.
584 R. E. C. Penny (Caudron Biplane, Temple School, Hendon), Aug. 9th, 1913.
585 2nd Lieut. Joseph Frederick Mead (Royal Fusiliers) (Bristol Biplane, Bristol School, Brooklands), Aug. 11th, 1913.
586 Shipwright William Cole (Short Biplane, Naval School, Eastchurch), Aug. 13th, 1913.
587 Capt. Henry Cholmondeley Jackson (Bedfordshire Regt.) (Bristol Biplane, Bristol School, Brooklands), Aug. 13th, 1913.
589 Lieut. Napier Charles Gordon Cameron (H.M. Land Forces) (Bristol Biplane, Bristol School, Brooklands), Aug. 13th, 1913.
590 Surgeon Frederick George Hitch, R.N. (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 14th, 1913.
591 Donald William Clappen (Blériot Monoplane, Blériot School, Hendon), Aug. 15th, 1913.
592 Lieut. Charles Curtis Darley, R.A. (Bristol Biplane, Bristol School, Brooklands), Aug. 15th, 1913.
593 Gordon Tsoe Kwong Wong, Chinese subject (Bristol Biplane, Bristol School, Brooklands), Aug. 15th, 1913.
594 Engine Room Artificer William Fleetwood Shaw (Avro Biplane, Avro School, Shoreham), Aug. 15th, 1913.
595 Capt. Lewis Pugh Evans (Black Watch) (Bristol Biplane, Bristol School, Brooklands), Aug. 20th, 1913.
596 Richard Crofts Powell (Bristol Biplane, Bristol School, Brooklands), Aug. 20th, 1913.
597 Lieut. Richard Edward Lewis (West India Regt.) (Bristol School, Bristol School, Brooklands), Aug. 20th, 1913.
598 Henry Webb (Vickers Biplane, Vickers School, Brooklands), Aug. 20th, 1913.
599 Capt. Cyril Francis Murphy (1st Royal Berkshire Regt.) (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 20th, 1913.
600 Second Lieut. Oswyn George William Gifford Lywood (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 21st, 1913.
601 James Claud Hendry (Petty Officer, R.N.) (Bristol Biplane, Naval School, Eastchurch), Aug. 20th, 1913.
602 Second Lieut. B. M. B. Bateman, R.F.A. (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 26th, 1913.
603 Lieut. W. R. Crocker, R.N. (Short Biplane, Naval School, Eastchurch), Aug. 28th, 1913.
604 Sergt. F. E. Bishop, R.M.A. (Short Biplane, Naval School, Eastchurch), Aug. 28th, 1913.
605 Lieut. Lord George Wellesley (Grenadier Guards) (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 28th, 1913.
606 Lieut. S. W. Smith, R.F.A. (S.R.) (Vickers Biplane, Vickers School, Brooklands), Aug. 29th, 1913.
607 Second Lieut. Lord E. A. Grosvenor (H.M. Land Forces) (Bristol Biplane, Bristol School, Brooklands), Aug. 29th, 1913.
608 Capt. C. P. Downer (Northants Regt.) (Vickers Biplane, Vickers School, Brooklands), Aug. 29th, 1913.
609 Capt. L. E. O. Charlton (Lancs. Fusiliers) (Bristol Biplane, Bristol School, Brooklands), Aug. 29th, 1913.
610 J. C. Joubert de la Ferte (Vickers Biplane, Vickers School, Brooklands), Aug. 29th, 1913.
611 Rowland Harper (Armourer's Mate, R.N.) (Short Biplane, Naval School, Eastchurch), Aug. 29th, 1913.
612 Capt. B. D. Fisher (17th Lancers) (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 30th, 1913.
613 The Hon. F. W. L. Vernon (Bristol Biplane, Bristol School, Salisbury Plain), Aug. 30th, 1913.
614 Joseph James Bland (Hydro-aeroplane) (Lakes Flying Company Hydro-aeroplane, Lake Windermere), Aug. 30th, 1913.

The following Aviator's Certificate taken in France was approved:—

Lord John Carbery.

Royal Aero Club Special Certificate:—

9 Lieut. Reginald Cholmondeley (R.F.C.) (Henry Farman Biplane), cross-country course: Netheravon to Chichester.

Aeronauts' Certificates:—

32 Lieut. J. D. Mackworth, R.F.C.
33 Sergt. L. E. Carter, R.F.C.
34 Lieut. The Hon. J. D. Boyle, R.F.C.

Airship Pilot Certificates:—

17 Lieut. J. D. Mackworth, R.F.C.
18 Sergt. L. E. Carter, R.F.C.
19 Lieut. The Hon. J. D. Boyle, R.F.C.

F.A.I. Conference (The Hague).—The report of the delegates who attended the Conference on behalf of the Royal Aero Club was received. The following are the decisions which were adopted:—

The Ninth Annual Conference of the F.A.I. was held at Scheveningen (The Hague) on Thursday, July 31st, and Friday and Saturday, August 1st and 2nd, 1913.

The countries represented were France, Great Britain, Germany, United States, Austria, Belgium, Holland, Hungary, Italy, Russia and Switzerland.

Aviators' Certificates.

It was decided that on January 1st, 1914, the altitude flight should be increased to 100 metres (328 ft.), and that the aeroplane should glide to the ground from that height with engine cut off.

Airship Pilot Certificates.

It was decided that on January 1st, 1914, the qualification should be 20 ascents in an airship in the case of the applicant possessing an Aeronaut's Certificate and 25 ascents if the applicant does not possess an Aeronaut's Certificate. The age of candidates was raised from 18 to 21.

Gordon-Bennett Race, 1914.

Following consideration of the report of the sub-committee appointed at Brussels, it was decided that the 1914 race for the Gordon-Bennett Trophy should be over a distance of 200 kiloms., the course to be at least 5 kiloms. round. It was also decided that each competitor should make a preliminary test to show that on an out and home course of 2 kiloms. the machine is capable of an average speed of less or not more than equal to 70 kiloms. an hour. Three attempts will be allowed to each competitor, and the machine must maintain an altitude of at least 30 metres.

Cross-Country Records.

It was decided that in future non-stop journeys in a straight line across country should be recognised as distance records.

Passenger Records.

It was decided that in attempts for passenger records actual passengers must be carried and not an equivalent weight in ballast.

A vote of thanks was passed to Mr. Roger W. Wallace, K.C., and Mr. Griffith Brewer for attending the Conference on behalf of the Royal Aero Club.

Cross-Country Record, with One Passenger.—In view of the recent decision of the F.A.I. to recognise the cross-country records, the Committee unanimously decided to accept as a British record the cross-country flight of Capt. C. A. H. Longcroft, of the Royal Flying Corps, on August 19th, 1913. Capt. Longcroft, accompanied by Lieut.-Col. F. H. Sykes, Commandant of the Royal Flying Corps (Military Wing), ascended at Farnborough at 9.40 a.m., and alighted at Alnmouth, Northumberland, at 3.10 p.m., without any intermediate landings, a distance of 287 miles. The aircraft used was a B.E., fitted with a 70 h.p. Renault motor.

Particulars of the flight will be sent to the Federation for its acceptance as a World's record.

Gordon-Bennett Aviation Race.—With reference to the Gordon-Bennett Aviation Race, which takes place at Rheims, on the 29th inst., the British and Colonial Aeroplane Co., Ltd., have written to the Royal Aero Club, withdrawing from the competition on account of pressure of business. The club will be glad to hear from any aviator desirous of filling the vacancy thus created.

British International Motor Boat Race.

The Royal Motor Yacht Club have kindly placed at the disposal of the Club a number of Honorary Membership tickets for the races for the British International Trophy. The races will take place on the 10th and 11th insts. at 3 p.m. in Osborne Bay, Isle of Wight, and Maple Leaf IV representing Great Britain will be in charge of Mr. T. O. M. Sopwith.

The Headquarters of the Royal Motor Yacht Club, the "Enchantress," will be moved to Osborne Bay for the races.

Members wishing to attend are requested to make application to the Secretary of the Royal Aero Club from whom all particulars can be obtained.

British Empire Michelin Competitions £800 and £500.

Intending competitors are reminded that these prizes are now open for competition, and full particulars can be obtained on application to the Club.

Paris—London Air Race.

It has now been decided that the Flying Race from Paris to London will take place early in October, and not on the 13th inst. as previously announced. Full particulars will be issued in the course of a few days.

166, Piccadilly, W. HAROLD E. PERRIN, Secretary.

THE ROYAL FLYING CORPS.

The following appointments were announced in the *London Gazette* of the 2nd inst. :—

War Office.—Commands and Staff.—Col. (temporary Brigadier-General) David Henderson, C.B., D.S.O., from Director of Military Training at the War Office to be Director-General of Military Aeronautics, and to retain his temporary rank whilst so employed. Dated September 1st, 1913.

R.F.C.—Military Wing.—The undermentioned to be flying officers. Dated August 14th, 1913: Capt. Wilfrid Picton-Warlow, the Welsh Regiment; Lieut. Ulick J. D. Bourke, the Oxfordshire and Buckinghamshire Light Infantry; Lieut. George E. Todd, the Welsh Regiment; Lieut. Reginald R. Rodwell, the Prince of Wales's Own (West Yorkshire Regiment); Lieut. Thomas W. Mulcahy-Morgan, Princess Victoria's (Royal Irish Fusiliers); Lieut. Reginald P. Mills, 5th Battn. the Royal Fusiliers (City of London Regiment); 2nd Lieut. Alexander Shekleton, the Royal Munster Fusiliers; and 2nd Lieut. Napier J. Gill, Royal Artillery. (*Note.*—The above-named officers to be seconded.) Second Lieut. Edward N. Fuller, Royal Flying Corps (Special Reserve); and 2nd Lieut. Christopher W. Wilson, Royal Flying Corps (Special Reserve).

The following appointment was announced by the Admiralty on the 30th ult. :—

Staff-Surgeon M. Cameron, M.B., to the "Hermes," for R.N. Flying School, Eastchurch, temporary, undated.

ROYAL FLYING CORPS (MILITARY WING).

WAR OFFICE summary of work for week ending August 30th :—

No. 1 (Airship) Squadron. South Farnborough.—The "Beta" and "Delta" were out several days this week. The "Beta" is giving every satisfaction since her last overhaul. It is hoped that the "Delta" will finish her trials next week.

No. 2 (Aeroplane) Squadron. Montrose.—This squadron is on its way to Ireland, but the machines have been considerably delayed on account of fog. Three machines are at Stranraer waiting to cross. The remainder are expected to reach the coast to-day.

No. 3 (Aeroplane) Squadron. Netheravon.—2,153 miles in all were flown by this squadron during the week. Several long cross-country reconnaissances were carried out, in one of which Lieut. Roupell damaged his machine and suffered slight injuries. Satisfactory results were obtained in reconnaissance work with troops in the Southern Command on the 26th.

No. 4 (Aeroplane) Squadron. Netheravon.—"A" flight (Breguets) and "C" flight (M. Farmans) carried out numerous reconnaissances daily. A party of officers and men are now visiting the Sopwith Aviation Works to gain experience of this type of machine.

No. 5 (Aeroplane) Squadron. South Farnborough.—The Maurice Farman flight were out daily, and are busy getting their machines and transport ready for Army manœuvres.

Flying Depôt (L. of C.). South Farnborough.—Experimental work on various lines are carried out on B.E.'s and Maurice Farmans. Lieut. Lawrence of No. 2 Squadron, took over a new B.E. 70 h.p. Renault, from the Royal Aircraft Factory, and was out testing her climbing capabilities on the 28th. He was forced to descend owing to darkness on attaining a height of 10,500 ft.

General.—Ten new officers reported themselves for duty on the 25th. They have been posted to various squadrons and are busy practising flying and observing preparatory to going on Army manœuvres next month.

R.F.C. Squadron Flies to Ireland.

CAPT. DAWES, on Tuesday of last week, on his Maurice Farman, set out from Montrose to fly to Ireland, and he was followed the next day by Capts. Longcroft, Tucker, and MacLean, and Lieut. Dawes, all on B.E. machines. Capt. Dawes was detained for some time at Dysart by fog, but later reached Stranraer; while of the others, Capts. MacLean and Longcroft got through, but Capt. Tucker was brought down in Fifeshire, and had his machine smashed through running into a wall, and Lieut. Dawes, through a petrol pipe breaking, had to stay overnight at Inverkeithing. Bad weather detained the machines at Stranraer until Monday, when Capt. Becke and Lieut. Waldron arrived on B.E.'s from Montrose. Capts. Dawes, Becke, and Longcroft, and Lieuts. Waldron and Dawes then set out on the trip across the sea to Ireland, but Capt. Longcroft had to go back for a slight adjustment to his machine. The others got across, and completed their journey to Rathbane, near Limerick, Capt. Dawes landing *en route* at Newcastle, co. Down.

Mr. Churchill and Col. Seely in the Air.

BOTH the First Lord of the Admiralty and the Secretary of State for War enjoyed trips in the air on Thursday last week. Mr. Churchill, who had paid a visit of inspection to the Calshot Flying Station, was taken by Lieut. Spencer Grey over the Solent and for some distance up Southampton Water, Col. Seely subsequently going up in the same machine.

FLYING AT HENDON.

A SPECIAL aviation meeting dedicated to cyclists and motor cyclists was held at Hendon on Thursday afternoon of last week, under very pleasant weather conditions for the spectators, if not quite ideal for the pilots, for although it was fine and sunny, there was just sufficient wind blowing to render racing anything but easy. The event of the day was a speed handicap for a trophy and prize presented by the Anglo-American Oil Co. (Pratt's). Before this handicap was flown, however, most of the pilots entered for it made exhibition and passenger flights. Marcus D. Manton, on the new 50 h.p. Grahame-White biplane, led off with a fine high flight, terminating in a very graceful spiral descent. Geo. W. Beatty and Pierre Verrier were also spiralling on their respective Wright and Maurice Farman biplanes, Louis Noel and R. H. Carr gave the G.-W. 'buses an airing and M. Debussy brought out a new 110 h.p. Breguet biplane. Some fast flying was also done by E. Marty on the 50 h.p. Morane-Saulnier. Very clever handicapping brought about an exciting finish to the first heat of the speed handicap, which was flown over a course of six laps of the aerodrome with three starters. These were Marcus D. Manton on the latest 50 h.p. G.-W. 'bus (4 mins. 5 secs.), Pierre Verrier on the Aircraft-Maurice Farman (2 mins. 7 secs.), and E. Marty on the 50 h.p. Morane-Saulnier (scratch). As lap followed lap, it was seen that Verrier was slowly but surely gaining on Manton, but it was not until the end was drawing near that one could judge Marty's relative position, as the limit man had completed nearly two laps before he (Marty) started. On the latter portion of the home journey, all three machines drew together, and excitement grew intense. Just before the finishing line, the fast little Morane-Saulnier shot ahead of the other two, and Verrier only managed to scrape in second, 1½ secs. behind Marty and 1½ secs. ahead of Manton. In the second heat (six laps), M. Debussy on the Breguet (2 mins. 24 secs.) got in an easy first; the limit man, R. H. Carr, on a G.-W. 'bus (6 mins. 6 secs.) being second, R. Slack on an 80 h.p. Morane-Saulnier, who started from scratch, being third, 7 secs. behind Carr. The final was flown over eight laps, and Debussy again came in first with Verrier 11 secs. behind, and 8 secs. ahead of Carr. The times and handicaps of the final are as follows :—

Speed Handicap for "Pratt's" Trophy.

Final heat (8 laps).	Start.	Handicap Time.
	m. s.	m. s.
1. M. Debussy (110 h.p. Breguet biplane)...	1 26	17 25
2. Pierre Verrier (70 h.p. Maurice Farman biplane)	2 53	17 36
3. R. H. Carr (50 h.p. Grahame-White biplane)	7 9	17 44
4. E. Marty (50 h.p. Morane-Saulnier monoplane)	scratch	18 1

Further exhibition flights followed the speed races, during which Gustav Hamel left for Birmingham (the scene of his match with B. C. Hucks, referred to elsewhere) on an 80 h.p. Morane-Saulnier monoplane, whilst Lewis Turner and J. L. Hall made flights on their Caudrons. Hall had the bad luck to smash his chassis and Garuda propeller on landing. During the evening a new Grahame-White biplane was brought out for trial. This machine, which is of huge dimensions, is of the Henry Farman type, with a 90 h.p. Austro-Daimler engine, and seats five. The pilot sits forward in the *nacelle*, and the passengers are arranged in pairs behind. After taxying across the ground with its full load it was found that further adjustments were necessary, so it was returned to its hangar.

Second August Meeting.

On Saturday last a large attendance gathered to witness the second August meeting, all the enclosures being exceptionally well filled. There was little or no wind, so the flying was excellent in every way, amongst the visitors being General Henderson, Col. Sykes,

"Flight" Copyright.

M. A. Debussy in the pilot's seat of the Breguet biplane with which he came to grief on Saturday last.

Messrs. A. V. Roe and W. Moorehouse. Just before 3 o'clock W. P. Raynham arrived from Brooklands on the 50 h.p. Gnome-Avro biplane, and immediately after W. Birchenough, R. H. Carr, and Marcus D. Manton ascended on the Grahame-Whites. From thence onwards numerous exhibition and passenger flights were made by Lewis Turner on the 45 h.p. Caudron, E. Baumann on a 35 h.p. Caudron, E. Marty on the 50 h.p. Morane-Saulnier, G. W. Beatty on the Gyro-Wright, taking as passenger on one occasion N. Spratt, Pierre Verrier on the Maurice Farman and M. Debussy on the 110 h.p. Breguet. Shortly before 4 o'clock a start was made for speed handicap, which was flown in two heats of six laps each and a final of eight laps.

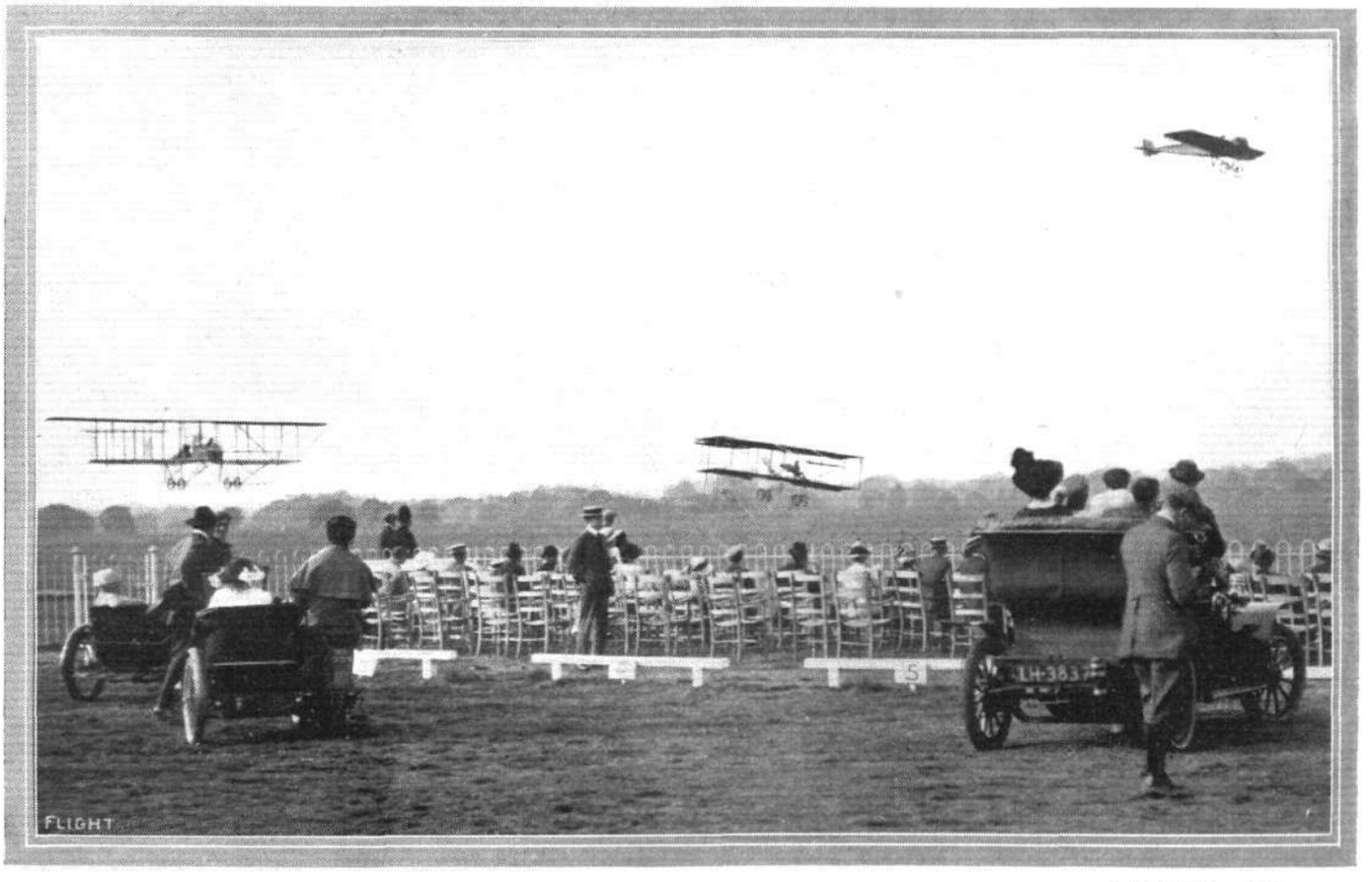
The first heat was made up of W. Birchenough on the 50 h.p. G.-W. 'bus (4 mins. 51 secs.), Marcus D. Manton on the later-type 50 h.p. G.-W. 'bus (4 mins. 26 secs.), Lewis Turner on the 45 h.p. Caudron (4 mins. 16 secs.), Pierre Verrier on the 70 h.p. Aircraft-Maurice Farman (1 min. 36 secs.), and E. Marty on the 50 h.p. Morane-Saulnier (scratch). Manton passed Birchenough on the fourth lap, and came in an easy first. Birchenough only just obtained second place, Marty following close upon him one second behind. Turner was apparently out handicapped, for he lost about 30 seconds per lap from the leading machine (Manton's), and he therefore retired towards the end of the heat, leaving Verrier to come in last. Four started in the second heat as follows:—R. H. Carr on the 50 h.p. G.-W. 'bus (4 mins. 44 secs.), W. P. Raynham on the 50 h.p. Avro (1 min. 11 secs.), M. Debussy on the Breguet (45 secs.), and R. Slack on the 50 h.p. Morane-Saulnier (scratch). Carr retained the lead throughout, but Raynham was passed by Debussy during their third lap, the latter therefore obtaining second place, and Raynham third. The final heat was practically a biplane affair, for it was made up of the three G.-W. 'buses and the Breguet. The order of starting was—Birchenough (5 mins. 23 secs.), Carr, (4 mins. 42 secs.), Manton (4 mins. 12 secs.), and Debussy (scratch). Birchenough piloted his machine splendidly, flying low and close to the pylons, and maintained the lead to the end. Debussy followed him up very closely and passed Manton on the last lap, thus obtaining second place 4 secs. behind Birchenough and 8 secs. ahead of Manton.

Speed Handicap. Final Heat, 8 laps.

		Start.	Handicap Time.
		m. s.	m. s.
1.	W. Birchenough (50 h.p. Grahame-White biplane)	5 23	18 47
2.	M. Debussy (110 h.p. Breguet biplane)...	scratch	16 51
3.	M. D. Manton (50 h.p. Grahame-White biplane)	4 12	16 59
4.	R. H. Carr (50 h.p. Grahame-White biplane)	4 42	17 8

After the final heat Debussy, accompanied by Messrs. H. de Havilland and R. Goodman-Crouch as passengers, left for Farnborough on the Breguet—meeting with their accident on the way, which fortunately did not result in a loss of life. Some further exhibition flights were made by the various pilots, including a magnificent display by Lieut. Porte on the 110 h.p. Deperdussin, and several circuits by Lord Carbery on a Morane-Saulnier. The latter pilot smashed the tail of his machine on landing. The event of the evening, however, was a further trial flight by the 90 h.p. 5-seater char-à-banc. Necessary adjustments had been made and a Garuda propeller fitted. After having its photo taken (with those responsible for its existence seated in the *nacelle*) by a host of photographers, it was taxied across to No. 1 pylon by Claude Grahame-White, after which Louis Noel took over the control, and accompanied by R. H. Carr only, made a brilliant flight lasting some 15 or 20 mins. at a height of several hundred feet. The biplane behaved splendidly and appeared to be very stable, in fact the passenger walked about in the *nacelle* without any apparent ill-effect.

On Sunday, a persistent downpour of rain prevented the usual exhibition and passenger flights from taking place. At about 6 o'clock in the evening, however, Louis Noel made a further trial with the new 90 h.p. G.-W. char-à-banc. This time he carried four passengers, reaching a height of about 600 ft., and remaining aloft for 10 mins. His passengers were W. L. Brock, R. H. Carr, and two mechanics. It will be interesting to see how far this experiment of a large carrying capacity biplane is successful, for there is certainly a want for an aerial 'bus of this kind now that passenger flights have become so popular.



"Flight" Copyright.

A FINE FINISH AT HENDON.—Marty, Verrier and Manton finishing in the order given in the first heat of the Speed Handicap on "Motor Cycle Day."

THE "DAILY MAIL" ROUND BRITAIN RACE.

IN our last issue particulars were given of the race round Britain, from Southampton to Dublin, and the unfortunate smash there on Wednesday, last week. Next morning the machine was dismantled for its return, but during the night several things had disappeared, notably one of the radiators, which appeared to have been cut away. Hawker himself had some difficulty in superintending the work, as he was simply besieged by photographers and autograph hunters. As soon as the machine was packed up, Hawker prepared to return to London, where he arrived on Friday. Kauper, the mechanic, had to remain behind in hospital, and all are glad to know that he is making good progress towards recovery.

Among the many messages received by Hawker and Kauper, those from their home country were especially appreciated. Sir George Reid, High Commissioner for Australia, wired: "Win or lose, Australia is proud of you both"; while Mr. Robinson, the Agent-General for Queensland, sent a message reading: "Queensland warmly congratulates you both on splendid achievement, the merit of which is not detracted from by the regrettable accident that prevented you from reaching the goal."

Another important congratulatory message was the following from Mr. Winston Churchill, First Lord of the Admiralty, to the *Daily Mail*:—

"Mr. Hawker has achieved a wonderful result, and the accident which prevented complete success in no way detracts from the merit of a feat at once memorable and serviceable. The whole competition has been of real value to British flying. Though we started last we must persevere till the first place is gained and held."

In view of conflicting reports as to the way the accident occurred the Royal Aero Club issued the following statement:—

"With reference to certain reports that the accident to the Sopwith biplane, used by Hawker in the recent race round Great Britain, was caused by the wings breaking in the air, the Royal Aero Club has carefully investigated the matter, and finds that the wings were entirely intact at the time the aeroplane struck the water."

On Saturday Hawker was busy at Brooklands testing two Sopwith machines and carried up a large number of passengers, while on Monday he visited the *Daily Mail* offices in company with Messrs. T. O. M. Sopwith, G. Green, Fred May and H. E. Perrin, and was presented with the consolation prize of £1,000.

Mr. Thomas Marlowe, the editor of the *Daily Mail*, addressing Mr. Hawker, said: "In handing you this cheque for £1,000 I may mention that this is the eleventh prize—making £24,750—that the *Daily Mail* has given for the encouragement of airmanship, and, like all the others, it is due to the direct initiative of Lord Northcliffe, the chairman of our company. I am sorry that, owing to his absence in America, he is unable himself to present it to you as a tribute to your courage and in recognition of the fact that you are the first man—and a British subject, too—to fly 1,000 miles over the sea. That, as I think we all agree, was a very great performance, one that shows that the waterplane is a weapon which will become of great value for military and naval purposes, and consequently a prime necessity of this island country.

"I have also to hand to you a gold medal presented by the Mayor of Margate for the first airman to pass that town in this race, and another medal, which he asks me to hand to you for Mr. Kauper, your passenger. There is a third medal from the Mayor of Margate which he asks me to hand to Mr. Sopwith, the owner and designer of your waterplane.

"Here is a great bundle of letters which I have received for you. I have no doubt they all contain wishes in which we join—that you will be the first home when the race takes place next year.

"Finally, let me say that our greatest thanks are due to the Royal Aero Club, and especially to Mr. Perrin, the secretary of the club, for the admirable arrangements they made for the control and observation of the flight."

Mr. Hawker briefly expressed his thanks. On behalf of the Sopwith Company, Mr. Sopwith proposed a vote of thanks to the *Daily Mail* for the "very sporting way" in which they had promoted the competition; and Mr. Green, who built the engine, seconded.

In reply, Mr. Marlowe emphasised the important part which Mr. Sopwith and Mr. Green had played. "They made this flight possible. They brought it so near to success that it must be achieved next year, and I can only hope that when the prize is won they may be very near the winning post."

Previous to the presentation, Mr. Marlowe gave a luncheon at the Royal Automobile Club, to commemorate the recent flight round Great Britain. Among the company were Mr. H. G. Hawker, Mr. T. O. M. Sopwith, Mr. F. May, Mr. Green, Mr. Harold Harmsworth, Mr. Harold Perrin, Mr. Hamilton Fyfe, Mr. Ashworth Briggs and Mr. Sutton.

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TO LITTLE WILLIE.

A man who calls a spade a spade,
Who flies for sport and not for trade,
Green-engined Short, all British made.

Two Gordon-Bennetts thou hast sailed,
The trim "Corona" oft hast trailed
O'er many lands till ballast failed.

The Moon describing its ellipse
Has drawn thee thrice to an eclipse,
Thy sole reward—dark maiden's lips.

When planes the Navy could not buy,
Who helped the sailor boys to fly
At Eastchurch in the summer sky?

On days when others fume and swear
Seldom dost thou pollute the air,
With language flying men can't bear.

Flying on thine aeroplane
When the sun begins to wane,
Gnomeing round the sheds again.

Gliding gently back to earth,
To the land that gave thee birth.
Smiling in thy merry mirth.

Dreamy eyes so meek and mild
Full of goodness as a child,
Soft as violets growing wild.

Generous beyond compare,
Loved by ladies everywhere,
Both by "*filly*" and by *mère*.

May maidens all thy vows believe,
And many may'st ye yet deceive,
Before the day thou hast to leave

THE GOVERNOR.

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The "Wight" Seaplane Trials.

RELATIVE to the report from a correspondent of the tests made by Mr. Gordon England with the "Wight" seaplane off Cowes last week, we have received the following information from the designer, Mr. Howard Wright:—"The machine as flown weighed 2,200 lbs., 600 lbs. of which was useful load. She leaves the water in about 30 yds. with no wind; she climbed 1,000 ft. in just under 2 mins., and with engine shut off glided from that height about 2½ miles from just over Calshot into Cowes Roads. Her maximum speed *at present* is 65 m.p.h., and her minimum 30. She was very quick on her controls fore and aft, and just as easy to fly as a first-class land machine. The inertia of the floats is not apparent to the pilot. You can readily see that lifting 4½ lbs. per sq. ft. at a speed of 30 m.p.h. makes the lift constant quite exceptional. The maximum horse-power employed at any time was 120, propeller revolutions being 1,150. The cause of the early accident was that the centre of pressure is very considerably further forward than the model shows, so that the machine on the first and second occasion was *very* tail heavy. Our machine is quite automatic laterally. She takes a correct "bank," remains on it, and comes off the banking automatically without the use of the ailerons. The behaviour of the floats on the water appears to be very good.

The Maidenhead Smash.

IT was tragical that after his success in the Speed Contest at Hendon on Saturday Debussy should have met with disaster later in the afternoon when taking the machine across to Farnborough. He started from Hendon on the Breguet with Mr. H. de Havilland, who only recently qualified for his *brevet*, and Mr. R. G. Crouch, of the Breguet Co., as passengers, at about half-past five and all went well until over Maidenhead, when the engine began to give trouble, subsequently found to be due to a broken exhaust-valve. As the engine stopped, the pilot apparently tried to plane down into a field near Bray, but from a height of 60 ft. the machine, after flattening out, dived into a field of mangolds. All three occupants were seriously injured, Mr. Debussy sustaining concussion of the brain and a bad sprain of the right ankle, Mr. de Havilland had his left arm fractured, while Mr. Crouch had his right leg broken, both the latter being also cut and bruised a good deal.

FLIGHT

ARMCHAIR REFLECTIONS.

By THE DREAMER.

The Flight Round Britain—And Its Lessons.

HAWKER is back again at Brooklands. He did not complete the course, and so did not win the prize; he did, however, put up a really wonderful performance, and his flight should teach many lessons to those who wish to learn. You were all interested in this race against time; you all took your morning paper, to read over again all that you had already read in the evening papers of the day before; of which papers you bought every edition as they came out; starting with the "ten o'clock special" and finishing with the "six-thirty." You read of the triumphant entry into each control; how the people cheered, how the sirens rent the air with their blast; and of the handshakes and God speeds at the departure for the next "scene" in this rapidly unfolding drama—because it had all the elements of a drama in it. Did not the very reading of it make you thrill through and through? Did not you, in your mind, accompany Hawker in his flight? "Hawker reaches Yarmouth," did not the very excitement of it bring tears to your eyes as you read? "Hawker ill, and cannot continue," did not your spirits drop to zero? "Pickles takes Hawker's place." Once more your spirits mount—Pickles is a good pilot, he'll do it. "Pickles unable to start; waterplane smashed," once more despair. Then the second attempt, with Hawker once more back in the pilot's seat, and the excitement all over again—Ramsgate, Yarmouth, Scarborough, Aberdeen, Cromarty, Oban in two days; can he by any possible means get to Dublin to-night? No, he must stay at Oban. Now can he do Dublin and Falmouth in one day? It is just possible, and if done leaves Falmouth to Southampton to be flown before nine-thirty on the morning of to-morrow—two-hundred-and-two miles, with perhaps five hours of daylight to do it in. "Hawker leaves Oban," and then the fateful message "Hawker's accident. Machine wrecked"; surely there is the element of drama in this, in sufficient quantity to satisfy anybody. But now that the excitement of the flight is over, and we are able to sit down and reason things out, there are many lessons to be learnt. It is by experience that we progress, and although, and rightly so, the experience of this particular flight, is to a great extent contained in the knowledge Mr. Hawker himself has gained—to be used by him, for and on behalf of the firm he represents, there is much to be learned by all of us.

Perhaps the first thing that strikes one is the magnificence of the handicapping of Time *v.* Machine; with a prize of £5,000, which will certainly be paid over if won, but which has got to be won, and not merely scooped up. Fifteen hundred miles in seventy-two hours works out a speed-distance of, roughly, 21 miles per hour, and with a machine capable of 60 miles per hour, looks fairly reasonable, even allowing for slight mishaps and rest. Hawker, taking things all round, had the best of luck as regards weather and absence of serious trouble, yet, had the accident that put a stop to his flight not have happened, his luck would have had to continue right up to the finish, with every ounce of skill he might possess thrown in, to have enabled him to finish on time, and without one minute to spare. Nine-thirty was the time limit, and had he finished and won, there is not much doubt, that with all the luck in the world, it would have been a question of stop-watch versus machine right up to the very last moment. The noise of the engine is a thing that will have to be taken into account in future flights of this duration. It must be terrible to sit there for so many hours on end, with this deafening row, a row that when one gets used to it, must be very dangerous to a man tired out with want of rest and sleep; as then it becomes a monotonous lullaby, loud as it may be, and, with a pilot in the condition indicated, is quite calculated to induce forgetfulness, not to say sleep. For this reason, also, I think dual control, and two pilots would be better than single control, with a pilot and mechanic; one of them could then get, if not actually sleep, at least a little rest at times, and be able to stretch his legs.

The slipping of the foot from the rudder bar also should teach its lesson. I have seen it stated that Hawker was wearing rubber-soled shoes. The fatal accident to poor Fenwick at Salisbury was, rightly or wrongly, thought by many people to be caused by this same thing, the slipping of rubber on a wet rudder bar; rubber will stick pretty tightly to wet wood, up to the point where it commences to slip, and then, when once started, it takes a great deal to stop, as witness the slipping of rubber tyres on wet wood pavement. Surely something in the way of a stirrup could be arranged. I do not mean something for the pilot to put his feet right into, so that in the event of an accident he could not get them free; but just a sort of shape to fit the boot, more or less closely, and so prevent that sudden slipping when ruddering hard over.

With the Sopwith machine itself, I do not know that I can suggest any improvement, although no doubt Hawker has learned of little things that may be seen to on later machines. It appeared to me to fly as well as it is possible to make a machine fly. The floats are, of course, the weak point if there is any sea on. This was proved beyond all doubt at Yarmouth. It was, I believe, the only time it was on rough water, and the floats suffered. Just what can be done in this direction, I cannot say, but it is extremely unlikely, that in future attempts for this prize, the same luck, with regard to smooth water will obtain as on this last occasion. I am not a constructor of aeroplanes, so must leave the solution of this problem in better hands. With regard to the engine I think the Green has proved that an English engine can be built, which is every bit as good as any foreign engine on the market. Most of the papers stated that "Hawker was down with engine trouble" once or twice in the course of his flight. Well, there is engine trouble, and engine trouble, and I don't think anybody expected this, or any other engine, was going to run for over three days on end, without some little thing requiring attention, and every little attention on an aerial engine means a descent, and is of course engine trouble, but not what is broadly meant and understood by the term. If it comes to that, how many motor-car engines are there, even after all the years of experience obtained in this industry, which could be expected to, or would if expected, run on Brooklands track twelve hours a day, for three days, under a full load during every minute of the run, without any repairs except such as could be done on the track, and then, to be strictly fair, only such repairs as might be done by two men; a pilot and his mechanic, standing on the floats of their machine, floating on the sea? Hawker did, I believe, have to come down once or twice owing to engine "trouble," but the trouble was not

what is really meant by the term. If the exhaust pipe gets hot and burns the rubber connection of the water-jacket pipe, it is of course engine trouble, but not trouble with the engine proper. It must be remembered that longer exhaust pipes were fitted in order to better carry away the fumes, and no doubt this led to the trouble, a serious one on a flight like this, as Hawker once lost so much water that he had to descend and fill up with sea water; but this is really a minor matter and soon remedied.

Of the pilot, there is nothing to say, which is saying everything; and we have others like him, which is saying everything. The next attempt on this circuit will put up a grand show—we are learning, and shall have learned. Keep your handicap as stiff as it is, if you wish, Mr. Handicapper; that cheque will have to be drawn next time.

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THE HUCKS—HAMEL RACE.

TREMENDOUS excitement was aroused in the Midlands by the race between Gustav Hamel and B. C. Hucks last Saturday, and the race turned out as exciting as it promised to be, for Hamel only won by 20⅘ secs. Some little disappointment was occasioned by the fact that the two flyers were unable to use identical machines as had been originally intended. Hamel, however, took down an 80 h.p. Morane-Saulnier, but in consequence of the change in the conditions the stakes of £500 a side were withdrawn, and in order to handicap his machine, which was faster than Hucks' Blériot, Hamel carried his mechanic. Both aviators got away with a good start two seconds after half-past two from the Tally Ho grounds at Edgbaston, Birmingham, the crowd of about 30,000 giving them a very enthusiastic send-off. Hucks struck out a bee-line for the first control, Redditch, but Hamel was flying a little wide. He, however, arrived at Redditch in 9 mins. 28 secs., leading Hucks by 24 secs. The fair ground was very restricted, and both pilots had to indulge in some manœuvring in order to get their machines down safely. Precisely at the end of the half-hour both machines got away in the order of their arrival.

On this stage Hucks gained a useful lead of 2 mins. by being able to keep a more direct course than Hamel, and he arrived at Coventry just as Sydney Pickles had finished a second exhibition flight on his Blériot. He was greeted with loud cheering, and before this had ceased Hamel was in sight and quickly made a perfect landing. During the 30 mins. wait, Pickles gave another exhibition flight, and then left for Birmingham. Immediately their time was up, Hucks and Hamel were away on the next stage to Nuneaton, a 10 mins. trip, at the end of which Hucks' lead had been reduced by half. The thick mist encountered made the going very difficult, but Mr. Hucks' careful study of the course helped him considerably, and he arrived at 4 hrs. 5 mins. 47 secs. The next control was at Drayton Manor, Tamworth, where Sir Robert Peel extended his hospitality to the flyers and their friends. At this point Hamel was leading by 55 secs., and after crossing the line landed in another field in the Manor grounds, as he feared the selected ground was too small for his speedy machine to land in. Hucks, however, made a splendid descent. This time the control was of 40 mins., a welcome opportunity for tea.

At 5 hrs. 32 mins. 55 secs. Hamel crossed the line in flight, having risen from his special landing-place and circled round. Within a minute Hucks had resumed the chase to Walsall, and he managed to reduce Hamel's advantage to 9 secs., the latter being handicapped by a connection between the oil-pipe and the pump breaking. At Walsall, Hamel deemed it prudent not to attempt to land in the official landing-ground, and, after circling round, came down in an adjoining field. When Hucks landed, his machine was surrounded by a great crowd, and when the half-hour's control was up some difficulty was experienced in getting the people off the course. As a matter of fact, Hucks got away to Birmingham with a slight advantage, but he was unable to keep it, and just as the Tally Ho ground came into sight again Hamel got past, as it were, in the home straight, and won by 20⅘ secs. He described it as the most exciting contest he had competed in, except, perhaps, the Circuit d'Anjou. Both pilots were conducted to the private enclosure, where Lady Coventry presented the *Birmingham Daily Post* trophy to Mr. Hamel; to Mr. Hucks a massive silver tankard from the same paper; and to Mr. J. C. Savage, upon whom the work of organisation had fallen, and who had made such excellent arrangements, a gold cigarette case. In addition to Lord and Lady Coventry, the company in the private enclosure included the Countess of Limerick, Lady Victoria Pery, the Rt. Hon. Wm. Kendrick and Mrs. Kendrick, Mr. and Mrs. Neville Chamberlain, Sir W. H. Vaudrey and Lady Vaudrey, Sir Whitworth Wallis, Mrs. Hucks (Mr. Hucks' mother) and Miss Hucks.

During the wait for the arrival of Hucks and Hamel at Birmingham, exhibition flights were given by Sydney Pickles on a Blériot and Edwin Prosser on his Caudron.

The times of arrival at the various controls were :—

	Hamel.				Hucks.		
	h.	m.	s.		h.	m.	s.
Start	2	30	2	...	2	30	2
Redditch ...	2	39	30	...	2	39	54
Coventry ...	3	27	44	...	3	25	44
Nuneaton ...	4	6	47	...	4	5	47
Tamworth ...	4	52	0	...	4	52	55
Walsall ...	5	44	0	...	5	44	9
Finish	6	22	10	...	6	22	30⅘

Subsequently Mr. Hucks issued another challenge to Mr. Hamel to race on similar machines, the race to be held, if possible, early next season.

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Fourny's Record for Michelin Cup.

ALTHOUGH there is a very little actually to report in the way of facts concerning the record of Fourny for the International Michelin Cup, it does point in an extraordinary way to the progress which has been made in aviation. It will be recalled that in its early days this prize was awarded for the longest flight over a closed circuit over an aerodrome, but for last year the conditions were altered so that although the prize was still offered for the longest flight over a closed circuit, the course had to be round two posts at least 50 kiloms. apart. The competitors were allowed to stop so long as their average speed did not fall below a stipulated minimum. Last year the prize was not awarded; but the first serious attempt was made a week or so back when Cavelier on a Deperdussin, in nine days flying, covered a total distance of 7,096·32 kiloms. On August 25th Fourny on a Maurice Farman set out to beat this record over the Etampes-Gidy course of a little over 100 kiloms. With unvarying monotony, and through wind, rain and mist, Fourny made seven rounds of the course each day, with an additional round on Monday, so that up to Tuesday evening he had covered 6,476·8 kiloms.

Guillaux Leads in Pommery Cup Competition.

AFTER careful checking of distances by a member of the French Army Geographical Staff, it has been found that the distance actually flown by Guillaux in his flight from Biarritz to Brackel, in Germany, was 1,386·7 kiloms., which beats Brindejonc des Moulinais' record of 1,382·6 kiloms. from Paris to Warsaw. In order to make his position more certain Guillaux is now arranging to attempt to fly 12 hours without a stop, and starting from Paris he hopes to come down for the first time about 95 miles beyond Warsaw, thereby avoiding a repetition of his unpleasant experience at the hands of the German officials.

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A German Cross-Country Record.

ON his "Albatross" biplane Victor Stoeffler, on the 26 ult., flew from Mulhausen in Alsatia to Schloppe about forty kiloms. from Insterburg. He had covered a distance of 1,200 kiloms., a new cross-country record for Germany.

Pegoud's latest Exploit.

FOLLOWING his successful experiment in abandoning his machine in mid-air and coming down on a safety parachute, Pegoud carried out another experiment on Monday. This time the trials were made under the supervision of M. Blériot, and with a Blériot machine fitted with special rudders. Taking the machine to a height of 1,000 metres, Pegoud made a very steep dive, then turned the machine upside down, flew in that position for about 400 metres, turned the machine into its normal flying position, and finally made an ordinary *vol plané*. On Tuesday, Pegoud repeated his flight before some representatives of the French military authorities. We refer in greater detail to this performance on p. 974.

"Flying" Bicycle Race.

ON Sunday last, a race was held at the Parc des Princes track, for bicycles fitted with propellers driven by the feet. The winner of the 500 franc prize was Rene Bernhard, who covered the two kiloms, three laps of the track, in 3 mins. 25 secs. His best time over a distance of 120 metres was 8⅘ secs., giving a speed of 41·8 k.p.h. Roger Dieudonne won the second prize of 200 francs.

AIRCRAFT AT THE MANŒUVRES.

THE Flying Corps units taking part in the Army operations in England will be the following :—

With the Brown Side.

No. 3 (Aeroplane) Squadron, R.F.C. Military Wing.

With the White Side.

Headquarters, R.F.C. Military Wing.
Detachments from the R.F.C. Naval Wing.
No. 1 (Airship) Squadron, R.F.C. Military Wing.
Detachment from No. 4 (Aeroplane) Squadron, R.F.C. Military Wing.
Detachment from No. 5 (Aeroplane) Squadron, R.F.C. Military Wing.
Detachment from the Flying Depôt, R.F.C. Military Wing.
No. 2 Squadron (from Montrose) is being employed separately on the Army Manœuvres in Ireland this year.

With the exception of the naval detachments and three officers, who will be attached from the Staff College as observers, all personnel will be found by the Military Wing. The naval detachments will consist of one of the new naval airships and a flight of four aeroplanes. The airship will work from the airship sheds at Farnborough, and the aeroplane flight will be attached to No. 5 Squadron of the Military Wing. They will take part in the operations on the White Side, being attached for the purpose to the Military Wing. The observers working in naval aircraft will be military officers, as this work requires military training. The pilots and ground crews of the naval aircraft will belong to the Naval Wing.

No. 3 Squadron of the R.F.C. Military Wing, with the Brown side, will also take part in the command and divisional operations which precede the Army exercises proper, and which commence about September 12th. Their aeroplanes will be recognisable by black and white stripes on the under surface of the lower planes. This squadron will as far as possible be on a mobilised basis.

The Flying Corps units, with the White side, will take part in the Army exercises only. They will move up to camps in the neighbourhood of Rugby during the week ending September 20th, with the exception of the naval airship, which, as already stated, is to work from Farnborough. No. 4 Squadron will consist of two flights, whilst No. 5 Squadron will comprise, besides 1½ flights of the Military Wing, one naval flight.

Four umpires are being attached to the aircraft of the two sides. These umpires are officers of the Indian Army at present undergoing training in aeronautics in England prior to starting a flying school in India.

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FROM THE BRITISH FLYING GROUNDS.

Brighton-Shoreham Aerodrome.

AGAIN the weather has not been all that could be desired, but nevertheless the Avro School, under the able instruction of Mr. A. Geere, has had all its pupils out in some form or other, and withal a general improvement has been noticed.

Mr. Elliott, who seems to be progressing very rapidly indeed, was out on Tuesday and Wednesday last week, and Lusteed, whose membership of the school is quite short, made a marked impression last week by putting up some really good work.

Friday was somewhat puffy, but Geere made a good show, testing the air and subsequently instructing the pupils. An ideal day followed and everybody was out, Mr. Pashley giving nice exhibition flights. Elliott and Lusteed, as well as Geere, were also flying, the Avro behaving particularly well. Monday and Tuesday good work was done, the weather on the latter day being absolutely perfect.

Brooklands Aerodrome.

Friday last week was a busy day at the schools, no less than six pupils, four Vickers and two Bristol (including Lord Edward Grosvenor) passing their *brevet* tests in workmanlike manner. Mr. Harry Hawker, fresh from his plucky attempt to win the *Daily Mail* waterplane competition round Britain, was busily engaged in testing Sopwith machines for the Admiralty.

On Saturday, engine tests were made with the de Bolotoff triplane, the début of which is much looked forward to, and the Martinsyde waterplane. The former machine is now only waiting for some small parts, and the latter is quite ready for a trial flight. Mr. Raynham flew to Hendon on the Avro biplane. Mr. Barnwell and Mr. Orr Paterson were busy with pupils and passengers on Vickers biplanes, as was Mr. Merriam on the Bristol biplanes. Mr. Dukinfield Jones was further testing the Flanders biplane (60 h.p. Isaacson engine). Mr. Hawker was testing two Sopwith biplanes carrying several passengers, including Mr. Pizey of the Bristol School at Salisbury, who afterwards took advantage of Mr. Sopwith's offer to make a trial flight, and spoke in high terms of the machine's flying capabilities.

On Sunday, arrangements had been made for Mr. Hawker to give exhibition flights on the Sopwith machines and to take up passengers, but the pouring rain rendered this quite out of the question. Mr. Hawker however will be at Brooklands again next Saturday and Sunday, on both of which days flights may be booked with him, and also with the other Brooklands pilots.

Bristol School.—Sunday afternoon Merriam for test, taking Lieut. Roche as passenger, and found rather bumpy, later for an exhibition flight, then with a passenger. Later up with Lieut. Strong, Lord Ed. Grosvenor and Lieut. Roche.

Monday last week very foggy early. 6.20 a.m. Skene made a test taking Lieut. Strong as passenger. Merriam afterwards up with same pupil, who had control all the time. Lieut. Strong then alone for first time doing very good straights and landings. Merriam up with Lord Ed. Grosvenor on several straights and circuits, having also control. Afterwards his Lordship alone, first time doing a circuit right away in fine style and landing perfectly. Merriam then with Capt. Fisher and Lieut. Playfair in succession on several straights and circuits; the former is nearly good enough to go alone, as he flies very well, but his landings are not quite perfect. Mr. Gaskell-Blackburn doing straights and circuits very well. Merriam finished with a flight, taking Instructor Skene for a joy ride. After breakfast, all busy erecting new machine.

In evening Merriam and Skene testing, the latter instructor up with Lieut. Hinds. Lieut. Strong doing circuits and eights in fine style, Mr. Gaskell-Blackburn also making circuits and eights very well. Lord Ed. Grosvenor flying circuits and landing neatly. Merriam up behind Captain Fisher on several straights, and also with Lieut. Playfair. After Lieut. Strong and Mr. Gaskell-Blackburn had another turn, Merriam finished with a solo to sheds, as it was quite dark.

Tuesday. Foggy early, later Merriam made a test of three circuits, taking Lord Ed. Grosvenor as passenger, and found the conditions were not good enough for school work. Too windy in the evening for flying. Next day, 5.30 a.m., Merriam test first, taking Lord Ed. Grosvenor as passenger. Then his lordship alone doing fine figures of eight, and landing well. Merriam then up with Capt. Fisher and Mr. Halford on straights and circuits. Lieut. Strong and Mr. Gaskell-Blackburn doing figures of eight, and both landing well. Skene finished with a solo to sheds as the wind was getting up. In evening, Merriam made a flight, taking Lord Ed. Grosvenor as passenger, and found conditions very bad.

Thursday, 5.30 a.m., Merriam tests, then with Lieut. Roche; afterwards wind got up suddenly. Merriam made a final test, taking Capt. Fisher as passenger, but still very bad. At 6.45 p.m., Merriam test, found bumpy; later tried again, taking a prospective pupil for a short trip. Lord Ed. Grosvenor following, flying well and practising landings for his *brevet*. Lieut. Strong and Mr. Gaskell-Blackburn a solo each, both flying very well, and can take their tickets when they like. Merriam giving tuition to Lieuts. Roche and Hinds. Darkness stopped further flying.

Friday, 5.15 a.m., Merriam testing, with Lieut. Roche as passenger, but found too foggy. Cleared at 6 a.m., Merriam then giving same pupil straights and circuits, this pupil then alone for first time flying good straights with good landings. Lord Ed. Grosvenor figures of eight, and *vol plané* landings to a spot in good style. Lieut. Strong and Mr. Gaskell-Blackburn circuits each, and practising near a mark, their landings being quite good. Merriam up behind Captain Fisher on several straights and circuits, giving him plenty of landings. This pupil then alone for first time, doing excellent straights, circuits, and good landings. Merriam then behind Mr. Halford on a figure of eight, and teaching him to *vol plané*. This pupil has the makings of a very good pilot. Lord Ed. Grosvenor, Captain Fisher, Lieut. Strong, and Mr. Gaskell-Blackburn, all another solo each, practising landing near a mark. Merriam gave more tuition to Mr. Halford, afterwards Merriam a solo alone to the sheds. A good morning's work, and all pupils progressing wonderfully well.

After breakfast Merriam tried conditions, storm came on; about 12.15 p.m. tried the air again and found quite good, then Lord Ed. Grosvenor made a solo, afterwards away for his *brevet*, which he obtained in a most skilful manner with *vol plané* landings to mark Afternoon, Merriam first up, then Captain Fisher took his ticket very well, making good landings. Lieut. Roche doing fine straights and circuits, Lieut. Strong good figures of eight, Merriam

finished, taking Mr. Halford for a flight as it was too dark for tuition work.

Foggy till 10 a.m., Saturday, rain afterwards. 11.50, Merriam tested the air, taking Mechanic Martin as passenger. Lieut. Roche then doing straights, circuits and right hand turns. Afterwards too bumpy for further flying. Afternoon, Merriam for solo, afterwards testing for engine trouble.

Vickers School.—Monday morning last week, Paterson test on biplane No. 20, then Capts. Downer and Charlton solos. Paterson, with Messrs. Ellis, Apps, Haskins, and Addis. Barnwell, cross country to Farnborough and back, non-stop, on Blériot monoplane —4,800 ft. In the afternoon, Barnwell, on Blériot mono., cross country to Shoreham and back. Knight, on biplane No. 20, with Mr. Addis, then with another passenger.

In morning Tuesday, Lieut. Smith, Capt. Downer, and Capt. Charlton solos on biplane 20. Capt. Ellis straights. Mr. Webb straights on No. 3 mono. Paterson on No. 5 mono. Barnwell on Blériot.

Wednesday morning, Knight test on biplane 20, then with Mr. Addis, Capts. Charlton and Downer solos. Barnwell, with Mr. Addis and Mr. Apps. Knight test on No. 3 mono. Lieut. Styles (new pupil) straights. Barnwell on Blériot.

Thursday morning, Knight on biplane No. 20, with Capt Ellis. Capts. Downer and Charlton solos. Barnwell with Lieut. Styles. Barnwell test on No. 3 mono.; Lieut. Styles straights. In the evening Knight on biplane No. 20, then Capts. Downer and Charlton solos. Barnwell test No. 3 mono., then Lieut. Styles straights.

Paterson on biplane 20, with Messrs Ellis, Apps, and Addis Friday morning. Knight on No. 3 mono., Lieut. Styles straights. Barnwell on No. 5 mono. Mr. Newton-Clare straights. Barnwell on biplane No. 20, with Messrs. Wynne-Roberts and Ellis. Capts. Charlton and Downer solos. Lieut. Smith solo. Knight, with Messrs. Apps and Addis. Mr. Chataway straights on No. 3 mono. Lieut. Styles straights. Lieut. Smith for *brevet* on biplane No. 20, getting through in excellent style, finishing in thunder shower. Later on, Capt. Downer took half his *brevet* in very good form, and Capt. Charlton had a short flight. In afternoon after test by Knight, Capt. Downer took second half of his *brevet*, and Capt. Charlton and Mr. Joubert de la Ferte also passed their *brevet* tests, all going through in first-class style, Capt. Charlton in particular doing some very short and well-banked turns. Knight and Capt. Ellis straights. Barnwell test No. 3 mono. Lieut. Styles straights.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Monday last week, Mr. Carpenter circuits with Instr. Birchenough and straights. Mr. Russell circuits with same instructor. Mr. Draper (new pupil) rolling under supervision of Instr. Manton. Sir Bryan Leighton straights and afterwards circuits with Instr. Manton in passenger seat. Mr. North circuits with Instr. Manton behind. Sir Bryan Leighton solo straights.

Next day, Mr. Francis circuits and Mr. Carpenter straights, with Instr. Birchenough. Mr. Draper rolling alone and afterwards making straights with Instr. Birchenough.

Mr. L. A. Strange straights with Instr. Manton behind, on Wednesday. Mr. Carpenter straights with Instr. Birchenough.

Friday, Mr. Francis, Mr. Carpenter and Mr. Draper straights with Instr. Birchenough. Sir Bryan Leighton, solo, straights and half-circuits. Mr. Blake, straights with Instr. Birchenough. Mr. Russell and Mr. Strange, circuits with same instructor. Later Mr. Strange and Mr. Draper circuits with Chief Pilot Noel.

Mr. Strange straights and Mr. Blake straights and circuits with Instr. Birchenough, Saturday. Mr. Russell circuits.

Hall's School.—Monday, last week, school out at 6 a.m. J. W. H. Scotland eight straights on Blériot, J. L. Hall flying Caudron meanwhile, at intervals.

Too windy Tuesday for school practice. Hall out for a short time in evening on Caudron, and Wednesday too windy again for school. Hall out on Caudron, climbing well against wind. Thursday, J. L. Hall exhibition flights.

Good weather once again, Friday. Scotland ten straights in good style.

Saturday, new elevator fitted to Blériot. Scotland leaves the ground for first time, making excellent straight flights.

W. H. Ewen School.—Monday, last week, the school was out at 7.10 a.m., under the instruction of Mr. L. W. F. Turner and M. Baumann. After test flight on 35 h.p. Caudron No. 1 by Mr. Turner, he handed machine to Mr. W. Watts, who was doing circuits, and Capt. Jenings, who was making progress in straight flights. The pupils were again out at 5.30 p.m., when M. Baumann, after test flight on 35 h.p. Caudron No. 2, handed machine to Mr. C. George, who was making straights and half-circuits in good style, Mr. Beatty also doing straights on same machine. On 35 h.p. Caudron No. 1, Mr. Turner, after test flight, handed machine to Capt. Jenings, who was doing straights and half-circuits, and Mr. Watts circuits. Mr. Bayetto also made a flight on same machine.

Pupils out at 6.5 a.m. on Tuesday. Mr. L. W. F. Turner made test flight on 35 h.p. Caudron No. 1, Capt. Jenings doing half-circuits, and Mr. Watts circuits on same machine. Commander Schwann made a flight of 40 minutes on the 80 h.p. Caudron. On Caudron No. 2, M. Baumann, with Mr. C. George, making good half circuits. M. Baumann made test flight on 35 h.p. Caudron No. 3, reaching 2,000 ft. in a few minutes.

School out at 5.30 a.m. on Friday. Test flight by Mr. Turner on Caudron No. 1. Capt. Jenings making good progress in half-circuits. Messrs. Warren and Goodden also made flights on same machine. Mr. Baumann made test flight on No. 3. On Caudron No. 2, Mr. C. George making half circuits. Pupils again out at 5.40 p.m., when Mr. Turner, after test flight on No. 1, handed machine to Mr. Watts, who was doing circuits, and Capt. Jenings half-circuits. Mr. Goodden also made flight on same machine, and M. Baumann up on *brevet* machine. On No. 2, M. Baumann instructing Mr. Carruthers, who was rolling, and Lieut. Holbrow, doing straight flights.

On Saturday morning, 7 a.m., Lieut. Holbrow doing straights on No. 2, under the instruction of M. Baumann.

Salisbury Plain.

Bristol School.—Monday morning last week no flying, weather conditions very bad. Pixton first out in the evening for trial, then giving tuition to Capt. Hay twice, Capt. Ferguson, Asst.-Paymaster Coles, Air-Mechanic Locker and Mr. Voigt. Jullerot on another biplane with Capt. Ferguson, Asst.-Paymaster Coles, Air-Mechanic Locker and Mr. Voigt. Sippe for solo on 80 h.p. Bristol tractor biplane, then Lieuts. Beroinade and Pascanu for solos at 3,500 ft., flying extraordinarily well. Mr. Delaplane also made two good solos on one of the tandem monoplanes.

Jullerot out first thing Tuesday for test, then biplane tuition to Asst.-Paymaster Coles, to Shrewton and Rolleston at 1,000 ft., and then with Air-Mechanic Locker. Later Jullerot with these two pupils, practising *vol planés*. Four good solos by Mr. Delaplane on tandem monoplane. Capt. Ferguson and Mr. Voigt each made their first biplane ascents in capital style, making two each. Jullerot solo on tractor biplane at 2,000 ft. Lord Wellesley three, Lieut. Bateman four, Lieut. Jenkins three, and Mr. Courtney three, good solos on biplanes, the landings being particularly good. After Jullerot had tested the conditions in the evening, Asst.-Paymaster Coles was taken for tuition, Mr. Garnett making a solo meanwhile on the tandem mono. Biplane solos by Lord Wellesley two, Capt. Ferguson, Lieut. Jenkins two, and Mr. Voigt. Rising wind prevented further flying.

Wednesday, very early, Jullerot made a trial, then took up Asst.-Paymaster Coles, Mr. Garnett being out for a monoplane solo. Biplane solos in good style by Lord Wellesley, Capt. Ferguson, Lieut. Jenkins and Mr. Voigt. Wind caused abandonment of work. In the evening, Jullerot up for trial, and later with Capt. Hay, Asst.-Paymaster Coles and Air-Mechanic Locker and a lady passenger. Jullerot and Sippe each solos on 80 h.p.

Lieut. Sydney W. Smith, R.F.A. (S.R.), who has just taken his Royal Aero Club certificate at the Vickers School, Brooklands.

Bristol tractor biplanes, both encountering rain. Lieut. Bateman set out for his certificate tests, which he accomplished in really good form, flying well throughout. Biplane solos by Lord Wellesley two, Capt. Ferguson two, Lieut. Jenkins, Mr. Courtney two, and Mr. Voigt. Messrs. Garnett and Delaplane very nice monoplane solos.

Lord Wellesley, Capt. Ferguson, Lieuts. Jenkins and Spence, Mr. Courtney and Mr. Voigt all out for biplane solos after usual trial Thursday. Jullerot busy with Capt. Hay, Asst.-Paymaster Coles and Air-Mechanic Locker, Pixton also taking these same pupils. Jullerot and Sippe solos on tractor biplanes.

Jullerot first up in the evening for trial. Mr. Farnall Thurstan for a trip, later giving tuition to Asst.-Paymaster Coles and Air-Mech. Locker. Jullerot solo on 80 h.p. tractor biplane, then again with Mr. Thurstan as passenger to 1,000 ft. Lord Wellesley passed the tests for his *brevet* splendidly, handling his machine in a masterly fashion, Sippe up for test, but found clouds rather low lying. Pixton giving biplane tuition to Capt. Hay, Asst.-Paymaster Coles and Air-Mech. Locker. Capt. Hay for his first solo, doing well. Capt. Ferguson, Lieuts. Jenkins and Spence, and Mr. Courtney, also out for good biplane solos. Pixton with Lieut. Bromet for tuition. Mr. Delaplane made a very good solo on the monoplane.

Nothing possible Friday morning owing to the weather.

Jullerot test in the afternoon, but found very bumpy and windy. Later, Jullerot out giving tuition to Lieut. Jenkins, Lieut. Spence, Lieut. Bromet, Air-Mech. Locker, and Mr. Voigt, and later on with Capt. Ferguson and Capt. Hay, afterwards taking Lieut. Bateman for a trip in the tractor biplane. Excellent biplane solos by Capt. Ferguson two, Lieut. Jenkins four, Lieut. Spence three, Mr. Courtney three, Mr. Voigt two. Pixton for a couple of solos on the biplane.

Bristol staff and pupils out early Saturday, but fog did not lift, and flying became impossible. Jullerot was out for a trial after breakfast followed by Lieut. Bromet for a solo, but conditions considered too bad for further work.

Pixton ascended in the afternoon for trial, giving two flights each to Asst.-Paymaster Coles and Air-Mechanic Locker. Mr. Voigt made a good biplane solo of 20 mins., whilst Lieut. Vernon, Asst.-Paymaster Coles two, Lieut. Bromet two, and Lieut. Halahan all out for flights, Mr. Voigt making another trip. Mr. Delaplane two long flights on a tandem mono at 1,000 ft. Sippe took a number of passengers for flights, afterwards making two solos on a new machine.

Royal Flying Corps. 3rd and 4th Squadrons (Netheravon).—On Monday week, Lieut. Abercromby was out on Avro for two flights of 15 mins. each, and Major Brooke-Popham one on Avro 290. Lieut. Roupell on H. Farman 286, solo, and then three flights with Lieut. Porter, for the purpose of observing. Lieut. Cholmondeley on H. Farman 274, and later went to Chichester and back, for his superior *brevet*, taking 2 hours 20 mins., finishing up with a splendid spiral. In the evening he made two more flights, taking up Mechanic Milner and Mechanic Miles some ten miles the other side of Winchester. Capt. Herbert on H. Farman twice, once with Lieut. Conran to Plaitford, for a 37 minutes' flight. Lieut. Allen four times on H. Farman, once with Capt. Kingston, and another time with Mechanic Reeves.

On Tuesday, Lieut. Allen was out on H. Farman. Capt. Herbert on H. Farman, taking Lieut. Burroughs. Lieut. Cholmondeley on H. Farman, taking up Mechanic Miles as passenger, for 55 mins., and two solo flights. Lieut. Roupell on H. Farman, with Major Brooke-Popham, to Farnborough and back in 2 hours 25 mins. Lieut. Abercromby out on Avro 285, and Major Brooke-Popham on Avro 290. Lieut. Joubert de la Ferte arrived from Farnborough on the new 80 h.p. Blériot, taking 1 hour 16 mins., and flying at the average height of 2,000 ft. Later he made two more flights on the machine. Lieut. Conran and Lieut. Wadham flying alternately on Avro 288.

Lieut. Herbert on H. Farman 284, on Wednesday, with Mechanic Wadham, after which he went over to Dorton in Oxfordshire, taking 2 hours. Lieut. Roupell also on H. Farman, with Mechanic Aylen as passenger, up for 40 mins., before departing for Dorton; his time was 1 hour 35 mins. Lieut. Cholmondeley on H. Farman, with Mechanic Miles. Lieut. Allen on H. Farman with Mechanic Littlejohn, C., also flew to Dorton, where Lieut. Cholmondeley made a solo flight, but, on landing, slightly damaged his machine. Lieut. Roupell and his mechanic were just off to Netheravon to report the accident, when, in trying to rise in too restricted a space, the machine failed. Lieut. Roupell was injured, and his passenger shaken. We wish Lieut. Roupell and his passenger a speedy recovery. Lieut. Joubert de la Ferte on 80 h.p. Blériot for a good flight of 40 mins., after which he made five flights. Lieut. Wadham out on 70 h.p. Blériot, and later made two flights, with Lieut. Lawrence and Mechanic McCudden. Lieut. Abercromby on Avro for two flights, once flying to Pewsy for 34 mins.

On Thursday, Lieut. de la Ferte made half-an-hour's trial on 80 h.p. Blériot, and then went to Stockbridge in 57 mins., flying at 2,000 ft. Lieut. Wadham on 70 h.p. Blériot, with Lieut. Porter, flew over the Isle of Wight, taking 2 hours 25 mins. out and home. Lieut. Conran out on 80 h.p. Blériot, and Lieut. Wadham on 70 h.p. Blériot. Capt. Herbert arrived here from Dorton, with Major Brooke-Popham, and Lieut. Allen, with Mechanic Littlejohn, arrived back from Dorton in 57 mins. Lieut. Abercromby made a trial on Avro 285, followed by a flight of 2 hours 5 mins. on reconnaissance work. Lieut. Burroughs and Capt. Picton-Warlow also out on an Avro.

On Friday, Lieut. Joubert de la Ferte on 80 h.p. Blériot, and Major Brooke-Popham, Lieuts. Wadham and Morgan on Avro.

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BRITISH NOTES OF THE WEEK.

General Henderson Inspects R.A.F.

ON Thursday of last week General Henderson, the recently appointed Inspector-General of Military Aviation, paid a visit of inspection to Farnborough and went through the Royal Aircraft Factory, under the guidance of the Superintendent, Mr. Mervyn O'Gorman, C.B. Subsequently General Henderson went for a trip in the airship, "Beta," piloted by Capt. Waterlow, while his Chief-of-Staff enjoyed a survey of Farnborough Common from a height of 2,000 ft. on a fast B.E. in charge of Mr. Ronald Kemp.

Trying for the Army Altitude Record.

AT Aldershot on Thursday of last week Lieut. Lawrence made a splendid attempt to beat the Army altitude record of 13,500 ft. put up by Lieut. de Havilland on Salisbury Plain last August. During a flight which lasted 1 hr. 40 mins., Lieut Lawrence, who was accompanied by Capt. Cordnor, R.A.M.C., reached a height of 10,500 ft.

A Roe Biplane for British Navy.

LAST week Mr. F. P. Raynham successfully put a 100 h.p. Avro biplane ordered by the Admiralty through its official tests at Eastchurch. With tanks full, *i.e.*, 36 gals. of petrol and 10 gals. of oil, and a bag of sand weighing 182 lbs., representing a passenger, the machine climbed 3,000 ft. in 19 mins. It was timed in the speed test to do 65·1 m.p.h. A 100 h.p. Avro hydro-biplane is also being delivered at Eastchurch this week.

Mr. Hewitt at Rhyl.

THE 10,000 or so troops who have been in camp at Rhyl have seen a good deal of flying, as Mr. Vivian Hewitt made quite a number of flights over the camps. Mr. Hewitt writes that from his monoplane Rhyl looked as if it were besieged.

The "Entente Cordiale" Race.

THE cash prizes, amounting to £700, offered by the International Correspondence Schools for a race from Paris to London, have been swelled to £1,200 by an offer of £500 from the French Aero Club. The first proposal was to hold the race next Saturday, but in order to give the French aviators an opportunity to take part, arrangements are now being made for the race to be held early next month with the finish at Hendon. Already four British pilots—Messrs. Gustav Hamel, B. C. Hucks, Robert Slack, and Lee Temple—have entered, and it is likely that there will be at least twelve starters, including some of the most prominent French aviators.

Hendon to "Brum" in 90 Mins.

IN preparation for his race with B. C. Hucks on Saturday, Gustav Hamel, on Thursday last week, flew his Morane-Saulnier from Hendon to Birmingham, a distance of a little over 100 miles, in an hour and a half, including a brief stop at Nuneaton in order to check his position.

Mr. Lee Temple's New Mount.

WRITING from Paris, Mr. G. Lee Temple informs us that he has purchased a two-seater Blériot monoplane, which has only been flown by Garros. He is practising on it at Issy, and hopes to take part in the Paris to London race in October.

More Naval Stations in Prospect.

ALTHOUGH there is no official information available yet, it is understood that enquiries have been instituted by the Admiralty with regard to the possibilities of establishing naval aviation stations at a spot about three miles south of Stonehaven, at Fraserburgh, and on the south side of the Firth of Forth.

Mr. Blackburn at Bridlington.

THROUGHOUT last week, Mr. Harold Blackburn was giving exhibition flights on his 80 h.p. Blackburn monoplane at Bridlington. Starting from Harrogate, where he had been flying for a few days, on the evening of Monday week, he flew with Dr. M. G. Christie to Bridlington, arriving in the twilight, being received by the Mayor. During the week he took up a number of passengers, and two of them were carried to Filey. Each day Blackburn was flying, and doing some fine banked turns over the bay. On Saturday, after taking up several passengers, he went with Dr. Christie over to Leyburn, a distance of about 75 miles, taking 70 mins. for the trip. Later the two journeyed by way of Ripon to Harrogate, where they landed on the Stray just as it was getting dusk. Flying with the wind this last trip of 40 miles was made in 23 mins. For the past two months Mr. Blackburn has been flying daily, and that the machine has been left out in the open without any protection from the weather speaks well for its sound construction.

Mr. Salmet has a Mishap.

WHILE landing from an exhibition flight at Scarborough on Thursday last week, Mr. Salmet, in avoiding two ladies who had strayed on to the landing ground, collided with some wooden railings and seriously damaged his machine. Mr. Salmet called upon us and explained that owing to the mist he could not see the ladies until he was within ten feet of them, and it was almost by a miracle that he was able to hoist his machine over them. It lends strong emphasis to the remarks which appeared in FLIGHT of August 23rd, in regard to rigidly keeping everyone clear of the alighting ground. At Scarborough there was a great demand for Mr. Salmet's autograph on postcards, and it was a splendid idea of his to turn this to good account by charging one penny, the proceeds to go to the Cody Fund. Mr. Salmet is anxious to give an exhibition flight on behalf of the fund, if someone will provide an enclosed ground near London.

Sale of Cody's Effects.

A PATHETIC reminder of the disaster to the Cody machine comes in the form of a catalogue of the contents of the workshops of Col. Cody on Laffan's Plain, which are to be sold by auction by Messrs. Kingham and Kingham on Monday next, the 8th inst. The lots include a complete Cody monoplane, two 60 h.p. Green engines, a 100 h.p. Green, and an 80 h.p. E.N.V., and, of course, a large assortment of fittings and accessories.

Cody Memorial Day at Earl's Court.

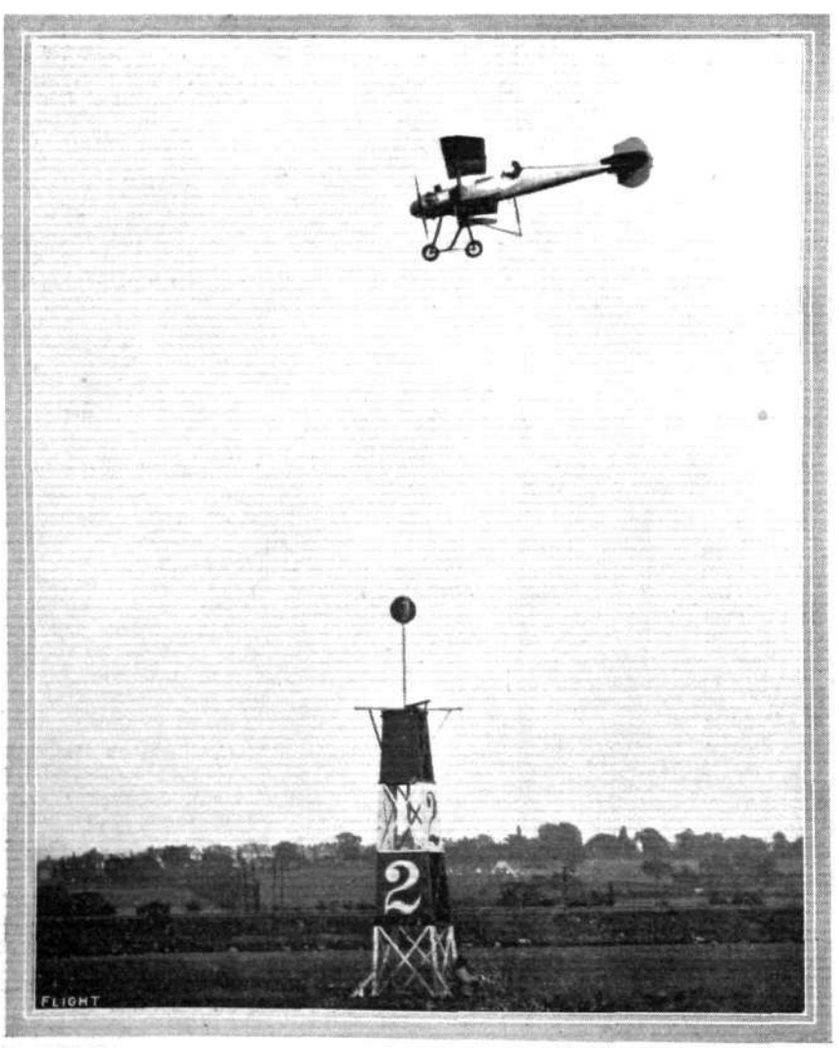
ARRANGEMENTS have been made by the Aerial League with the authorities of the Imperial Services Exhibition for Thursday next to be observed as a Cody Memorial Day at Earl's Court. There will be a reception of well-known aviators at the Welcome Club, where the many trophies won by the late Col. Cody will be displayed. Other special attractions will be a series of model hydro-aeroplane contests on the lake in the Queen's Court, and an exhibition of full-sized machines in the Western Gardens. In addition, Col. Massy will give two "picture talks" on aviation progress, while in the evening the firework display will include some aerial subjects and a portrait of Col. Cody.

Canton-Unne Engines in Great Britain.

ANOTHER addition to the growing list of British-built motors for aerial work is the Canton-Unne, which did so well in the recent French War Office tests. This is now being manufactured over here by the Dudbridge Ironworks, Ltd., near Stroud. Six engines are being built by the firm in order to take part in the competition for aerial motors which will be conducted by the British War Office next February.

A Gliding Club for North London.

WRITING from 4, Marquis Road, Bowes Bark, N., Mr. E. J. Field says he would be glad to get in touch with any of our readers in North London who are interested in gliding, with a view to the formation of a gliding club.



"Flight" Copyright.

M. A. Debussy flying the Breguet biplane at Hendon prior to his cross-country flight to Farnborough on Saturday last.

Protected Wire for Aeroplanes.

APROPOS of the quotation from Mr. Fred T. Jane in our last issue, *re* the need for a substitute for steel wire for use on hydro-aeroplanes, Mr. C. M. Berry of 1 and 2, Bank Chambers, 329, High Holborn, W.C., has brought to our notice a system of coating wire with an enamel-like preparation. This can be applied either by heat or by pressure, and it is claimed that it has no effect on the temper or flexibility of the wire, while it also demagnetises the metal.

A Win for Novavia.

IT is interesting to note that the wings of the Morane-Saulnier monoplane, with which Mr. Hamel won the *Birmingham Daily Post* Trophy in the race last Saturday, were doped with Novavia.

Shell and Vacuum Helped Hawker.

ALTHOUGH of course the pilot, the machine and the engine come in for the major portion of the credit when a big performance is made it should not be forgotten that there are other things which go to make it possible. For instance, during his flight from Southampton to Dublin, Hawker used Shell Spirit and lubricated his engine with Vacuum oil.

New Regulations in Germany.

THE German Minister of the Interior has recently drawn up a series of regulations, similar to those now in force in Great Britain, prohibiting flying over certain areas, to be defined by the Naval and Military authorities. The regulations particularly prohibit photographing from aircraft without a special permit, while long distance photography is altogether prohibited.

A New Farman Seaplane.

LAST week at Boulogne Henry Farman was testing a new seaplane, which has a new arrangement of the floats whereby they are able to adjust themselves so that the machine will ride steadily in a choppy sea. The machine is very quick on the controls, and can be turned very sharply. During one test Henry Farman flew out and catching up the outgoing boat to Folkestone, alighted alongside it, afterwards returning to Boulogne. On the 27th ult., he flew over to Deauville in order to demonstrate the machine to the Naval authorities.

FOREIGN AVIATION NEWS.

Etampes to Holland on a Farman.

HAVING finished his period of instruction at the Farman School at Etampes, the young Dutch pupil, Leo Van Steyn, decided to fly home. Starting from Etampes at 5 a.m. on the 27th ult., he landed after a non-stop flight of 6¾ hours at Duinkyk racecourse, near Wassenaar, and a few kiloms. away from The Hague. The distance covered by the H. Farman-Gnome was 600 kiloms.

The Dunne Biplane at Deauville.

COMMANDANT FELIX arrived at Deauville on the Dunne biplane on the 27th ult., having flown over from Evreux, at which place he had had to stop during a flight from Villacoublay on the previous day owing to a petrol pipe breaking.

Flying Round Paris.

TWO attempts were made last week by Helen on a Nieuport to again secure the Deutsch de la Meurthe Cup, which calls for a 200 kilom. flight round Paris, passing St. Germain, Senlis, Meaux, Melun, St. Germain. For this year competitors must show an improvement of at least 10 kiloms. per hour on Helen's last year's average speed, viz., 126 k.p.h. On the 27th Helen started off from Villacoublay at 5.30 a m. but had to give up at Melun, and a second attempt on the following day led to no better result.

A French General Flies.

ON the 25th inst. General Pistor, who is in command of the troops in Tunis, was taken for a trip by Lieut. Battini on a Farman biplane. In 1 hr. 8 mins. a distance of about 90 kiloms. was covered over Tunis, Carthage, and the neighbourhood.

Fine Flight by French Sapper.

FLYING at a height of between 2,000 and 2,500 metres, Sapper Thoret, on the 17th inst., flew from Avor, by way of Lyon and Amberieu, to Chalons-sur-Soâne, a distance of about 200 kiloms., in just under two hours.

After a Year's Work.

ON Monday of last week at Toul, Lieut. Prat, on an H. Farman machine given by the town of Nancy to the French Army exactly a year previously, climed 800 metres in ten minutes, and in half an hour was flying at 1,800 metres altitude. During the year it has been in service the machine has covered over 10,000 kiloms. in reconnaissances along the eastern frontier, but on being dismantled everything was found to be in perfect order, a testimony to the excellent workmanship and material used at the Farman works at Billancourt.

Aeroplaning for Singers.

LAST Sunday Mdlle. Julienne Marchal arrived at Buc on a Blériot which had been piloted from Deauville by M. Leblanc. It is claimed that this is the first time that an artiste has used an aeroplane to fly to her engagements, as Mdlle. Marchal was taken to Deauville last week by M. Leblanc.

M. Santos Dumont Comes Back.

AFTER a retirement which has lasted three years, M. Santos Dumont is thinking of taking up aviation again. On Saturday he was at Deauville and enjoyed a trip with Audemars, who will be remembered as about the only man, other than Santos Dumont, who could fly the Demoiselle. He is now going through a course of instruction at the Morane School at Villacoublay.

More Clement-Bayards for French Army.

AT Issy, on Friday of last week, Guillaux successfully put three Clement-Bayard monoplanes for the French Army through their official tests.

A Deperdussin Superior Pilot.

CRIBEILLET, a pupil at the Deperdussin school, at Betheny on the 28th ult., made the first test for a military pilot's certificate by flying round the Rheims–Mailly Camp–Sissonne course, with two landings, in three hours. Afterwards he flew from Rheims to Amiens.

Flying to the Manœuvres.

AN *escadrille* of half a dozen two-seater Deperdussins started from Betheny, on the 28th ult., to fly to their stations in connection with the manœuvres in the south of France. The first stage of their journey, to Etampes, was made in an hour and a half.

A New Swiss Pilot.

AFTER finishing his period of instruction at the Ponnier School at Rheims, Borrer showed his mettle by flying home from Mourmelon to Soleure in Switzerland. He has since given a good many exhibition flights, and has also carried on an aerial post, while among his exploits was flying from Soleure to the summit of the Weissenstein, 1,350 metres high, with a passenger and a sack of mails. Subsequently he flew back to Soleure. On Thursday of last week he flew with a passenger from Soleure over Berne, Neufchatel, and Bienne, and landed at Mulledorf, 1,000 metres high, afterwards returning to his starting point by way of Bienne and Grange.

Another Promising Nieuport Pilot.

LARTIGUE, a Comite Nationale pupil at the Nieuport school at Villacoublay, on the 24th ult. flew from Paris to Mourmelon and returned on Monday morning, this being one of his tests for a superior *brevet*.

Marquis De Dion in the Air.

ON the 26th ult. Maurice Farman and the Marquis de Larienty-Tholozan, both on De Dion engined M. Farmans, flew over to Rambouillet and back, their passengers being the Marquis and Marquise De Dion.

New Bathiat Superior Pilots.

TWO soldiers at the Bathiat Sanchez School at Mourmelon made one qualifying flight for superior *brevets* on a monoplane on Monday. They completed the circuit Mourmelon–Sissone–Mailly Camp–Mourmelon, in three hours, with stops at the two intermediate points.

An Italian Cross-Country Record.

ON the 24th ult. Lieut. Scarpis on a Farman biplane flew from Turin to Pordenone, a distance of 450 kiloms. in 5½ hours, a stop being made on the way at Cremone to replenish the petrol tank.

Farmans at Belgian Manœuvres.

LAST week two squadrons, each consisting of four Farman biplanes built in Belgium by the Antwerp firm of Bollekens, left the Brasshaet Aerodrome in order to take part in the manœuvres. One squadron flew to Lignon, near Ciney, a distance of 250 kiloms., while the other had to fly 280 kiloms. to Laneffe, jnst by Thuis.

Jensen Flies to Russia.

ON his Clement-Bayard monoplane, Jensen, on Monday, continued his journey from Peterswald, in Bohemia, to which point he made a non-stop flight from Paris, last week. Taking a northerly direction, he finally landed at Kalisch, on the Russian frontier, about 220 kiloms. south-west of Warsaw.

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AIRSHIP NEWS.

Long Voyage by Italian Airship.

THE Italian army airship P 4 started at midnight from Vigna di Valle near Rome and cruised to Calpato, close to Venice, in nine hours, beating the railway train by a couple of hours.

A Zeppelin over Heligoland.

ON Wednesday of last week the German Naval "Zeppelin L1" paid a surprise visit to Heligoland, and from 1 a.m. to 1.30 she played her searchlight upon the fortifications and the warships.

Italian Naval Minister in an Airship.

ADMIRAL MILLO, the Italian Naval Minister, on the 26th ult. enjoyed a long trip on board one of the military dirigibles of the M type stationed at Rome.

"Capitaine Ferber" Paid Off.

THE French military dirigible "Commandant Coutelle" arrived at Epinal from St. Cyr on the 26th inst. in order to relieve the "Capitaine Ferber," which, having completed her work for 1913, will be dismantled for overhaul.

The New German Naval Zeppelin.

THE new Zeppelin for the German Navy is now approaching completion in the works at Friedrichshafen, and from the few particulars that have leaked out, it appears that she will be three metres longer than L1. There are three cars, the centre one being for the accommodation of the pilots, while the first and last car will each contain two 200 h.p. motors, all the cars being connected by a gallery built into the hull of the airship.

"Adjudant Vincenot" for Manœuvres.

HAVING been detailed for specific work in connection with the manœuvres, the military dirigible "Adjudant Vincenot," with eight officers on board, on Monday week cruised 540 kiloms. from Issy to Albi.

Bigger Airship Docks for Zeppelins.

WORK has commenced on a new airship shed of large proportions at Friedrichschafen capable of housing two dirigibles of the Zeppelin type.

New Airship for Belgium.

THE new Zodiac dirigible, built to the order of the Belgian Government, made a trial trip of 1 hr. 5 mins. duration on the 22nd ult. Comte de la Vaulx was in charge.

DEAUVILLE WATERPLANE MEETING.

IN our last issue we were able to chronicle the results of the Deauville meeting up to the end of the second day. On the third day full advantage was taken of the good weather, and Renaux on the Maurice Farman completed the preliminary tests with the exception of that which required the machine with full load to rise, alight and rise again with a sea running with 3-ft. waves. Chemet on the Borel and Molla on the Leveque also progressed as far as this. Weymann on the Nieuport did the figure eight and the speed and duration tests, while his *confrère* Levasseur taxied round the quadrilateral course, made the alighting test in which the machine had to remain on the water with engine stopped for ten minutes and the turning test. Gaston Caudron carried out the duration test. During the day Henry Farman arrived from Boulogne on his new seaplane, while Commandant Felix flew over on the Dunne biplane from Villacoublay. On Thursday morning the weather was a little rougher, and it was announced that the judges had decided to make the alighting test without any reference to the height of the waves. Weymann, Renaux and Bregi completed their tests in the morning, and Gaubert who had received a pair of new floats from England taxied round the quadrilateral course.

Some excitement was caused during the day by a very realistic rescue of a drowning girl by a seaplane for the benefit of a cinematograph firm. Among the arrivals at Deauville by aeroplane was Corporal Defougere on a Caudron, and Leblanc on a Blériot, the latter taking Mdlle. Marechal from Paris to Cobourg, where she had an engagement to sing.

Friday saw Gaubert, on the second M. Farman, get through nine tests in one day, Moineau on a Breguet, Prevost on the Deperdussin, Chemet on the Borel, and Molla on the Leveque completing the balance of their ten preliminary tests. This was the last day of the preliminaries, and on Saturday the competition proper commenced with the speed contests over an oblong course of 10 nautical miles.

The prizes were in two series, the first for the best speed over the first ten laps, and the second for the best average over 25 laps. Renaux was the first to go, and he was followed by Gaubert. During the day seven of the machines started, but only four, Gaubert, Renaux, Moineau and Molla, covered the minimum distance of 180 sea miles. Renaux's time for 300 miles was 6 h. 40 m. 25 s., while Gaubert did the same distance. Prevost on the Deperdussin flew the 100 miles in 1 h. 48 m. 25⅘ s., but he had to be disqualified because he did not finish 18 laps, and so Moineau secured the leading place in the 100-mile test, with 1 h. 51 m. 4⅖ s. In the 250-mile event Molla was first in 5 h. 24 m. 14⅘ s., with Renaux second and Gaubert third. On Sunday, although the sea was very rough, Chemet qualified for prizes. Bregi, Moineau, Weymann and Molla started, but could not make any progress, and so there was practically no change in the positions, as Chemet did not improve on Moineau's time for the 100 miles, although, of course, he was faster than Molla and the M. Farmans.

The official awards were issued on Monday. In the endurance test for the greatest distance, above 250 sea miles, flown without a stop over the 10-mile course, Renaux and Gaubert divided the three prizes, totalling £1,000, to which was added the other prizes not awarded in the trials, so that each actually received £1,080. Each covered 300 miles. Renaux's Maurice Farman was fitted with a Renault engine, while Gaubert's used a Canton-Unné. Both had Chauvière propellers. In the test for the best speed over 250 miles, Molla was awarded the first prize of £400, while Renaux secured the second prize of £200. Molla's Leveque biplane was fitted with a Salmson engine and Chauvière propeller.

The first prize of £280 for the best speed over 100 miles was won by Moineau, while Chemet took the second prize of £120. Moineau's Breguet was fitted with 200 h.p. Salmson motor and Chauvière propeller, while Chemet's Borel had an 80 h.p. Gnome and Chauvière propeller. In the getting-off test Renaux and Gaubert were bracketed first, and each received £300. In the tests for machines arranged for starting from on board a ship. Caudron on his biplane with Anzani engine and Chauvière propeller won a prize of £240.

The Paris to the Sea Race Result.

ON the 28th ult. the Judges issued their award in the Paris to Deauville race, and as Levasseur was disqualified for not passing the control at Mousseaux, the second place was awarded to Molla on the Leveque. The winner was Chemet whose time was officially given as 3 hrs. 47 mins. 50⅗ secs., while Molla's time was 8 hrs. 46 mins. 11⅗ secs. Chemet won £1,066 and Molla £533.

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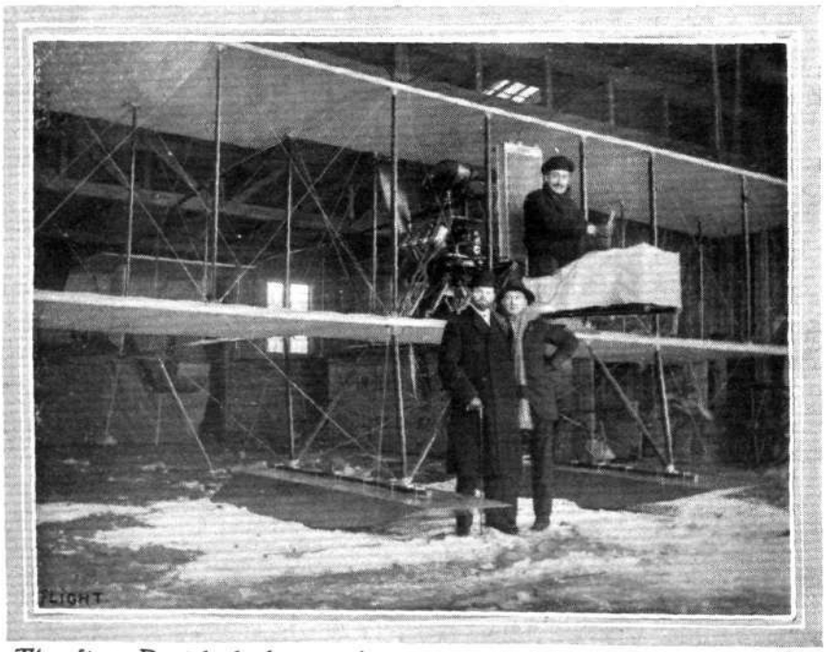
THE ROUND BERLIN RACE.

THE flying race round Berlin was one of the most successful competitions ever held in Germany, and it was witnessed by a huge crowd, which waited patiently in the scorching sun at the Johannisthal aerodrome, to watch the start on Saturday afternoon. The first to get away was Schüler on the Ago biplane, followed by V. Stoeffler on the Aviatik biplane.

The leaders at the end of the first day, when one round had to be covered, were: 1, Baierlein on Otto monoplane, 1 hour 35 secs., 1st prize, £250. 2, Stiplescheck on Jeannin-Pfeil-Taube, 1 hour 4 mins. 55 secs., 2nd prize, £100. 3, E. Stoeffler on Albatros-Pfeil biplane, 1 hour 5 mins. 20 secs., 3rd prize, £50.

On the second day, 13 out of the 21 entrants, were started within 14 minutes, V. Stoeffler on Aviatik biplane being first, followed at intervals of about 1 minute by the other competitors. In the first circuit Baierlein was again first on the Otto mono., his time for the first circuit being 55 mins. 5 secs. Böhm on Albatros mono had to make an intermediate landing at Drewitz, near Potsdam, and in doing so smashed his propeller. d'Ballod, on M. B. Taube, could not get his machine to climb, and had to return after making a forced landing at Karlshorst. Between the first and second circuit there was a compulsory stop of 15 mins. In the second round Baierlein was first again, and this time he completed the course in 51 mins. 14 secs. Janisch had to come down at Birkenwerder, and E. Stoeffler at Glienicke, both on account of engine trouble. Stiefvater came down at Klarahöhe near Lindenberg, and Krieger, who made a forced landing in the first circuit, did not return in time for the start for the second, as his engine gave trouble due to overheating. The best aggregate times for the three circuits (first and second day) were: 1, Baierlein, 3 hours 1 min. 54 secs. 2, Stiplescheck, 3 hours 14 mins. 32 secs. 3, Linnekogel, 3 hours 19 mins. 28 secs.



The first Danish hydro-aeroplane constructed by the young aviator, B. Rom (1) to the order of Mr. Loewenstein (2). It has been tested by the well-known Danish aviator, U. Birch, who is seen sitting in the pilot's seat. The biplane is equipped with a 65-h.p. E.N.V. motor, and the two main floats are built of wood, and are divided into nine water-tight compartments.

AT DEAUVILLE.—Commandant Felix flying on the Dunne biplane over the sands. Below in the foreground is a Henry Farman waterplane, and in the distance other waterplanes taking part in the French Government Waterplane Trials.

AT DEAUVILLE.—The Caudron biplane just getting away from the starting stage in the French Government Waterplane tests.

THE THEORY OF THE DUNNE AEROPLANE.

(*Continued from page 969.*)

Now from long experience with earlier arrangements of surface—as far back as 1904—I had managed to acquire a fairly complete empirical knowledge of the constructional device necessary to complete the turning stability. But this knowledge remained empirical until Professor Bryan supplied me with the proper explanation. He pointed out that an aeroplane travelling round a circle is not only describing a circular path, but is at the same time spinning round its own vertical axis.

The idea is a little complex at first, and one is apt to confuse, as I did, the resultant motion of the tips with the conception we have already taken into account, viz., that the outer tip is merely describing a bigger arc than the inner. But the two phenomena are really totally distinct. This will be evident if we look at Fig. 18. Here the aeroplane is travelling round the centre of the several concentric circles. These concentric circles show, where they meet the leading edges of the wings, the actual relative paths of the air-currents at those places. Because these wing edges slope back across the line joining the centre of gravity to the centre of the circles, and for no other reason, the air-currents impinge on the inner tip from a direction which runs more from inside to outside than does the direction of the air-current in normal straight-ahead flight. That is to say, they are able to strike on the underside of the inclined tip by getting at it from the inside—down the tunnel—and so lift this tip although it is geometrically negatively inclined to the straight-ahead direction. While on the outer tip the currents impinge from a direction which runs more from outside to inside than does the direction of the air-current in straight-ahead flight, if you will look again at Fig. 5 you will see that this means that the surface is more negatively disposed to these currents than it is to those coming from straight-ahead in normal flight, and so is more pressed down than in normal flight. While, with regard to the surfaces ahead of the line joining the centre of gravity to the centre of the circles, the currents on the inner wing impinge in a direction which runs more from outside to inside that the normal, and another glance at Fig. 5 shows us that the positive surface we find here opposes to them a deeper camber than it does to normal straight-ahead currents. The reverse obtains where the outer forward surfaces are concerned. Thus, again, the inner wing gets more lift and the outer wing less than in normal flight.

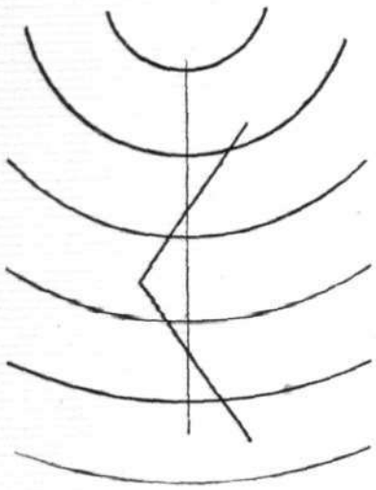


Fig. 18.

With a wing edge set parallel to the line joining the centre of gravity to the centre of the circles, this phenomenon would obviously not occur. With a "Zanonia" leaf form the lifting and depressing effects would be reversed, tending to increase banking instead of checking it, which, I imagine, is why the "Zanonia" form seems to do better in practice when the slope back of the wings is comparatively slight.

Now add to the effect we have just examined the fact that the outer tip is travelling faster than any other part of the machine, and we have ample explanation of the fact that this machine counterbanks when turned by an ordinary rudder.

Now we can get back to Fig. 17. We have ascertained that the tilted aeroplane cannot maintain the position shown, but that, if left to itself, the outer wing will sink towards its normal level, the centripetal force R diminishing towards zero as this occurs. Meanwhile, as we saw before, this wing also tends to hang back, and the inner wing to set itself forward. The machine is striving towards a position of equilibrium for that particular radius of turn, but never reaches it, because as it swings outward and levels up so does the turning radius increase and the centripetal force diminish. Equilibrium is only attained when the radius is once more infinity and the machine is travelling straight ahead on a level keel.

It follows that no matter how narrow or steeply banked the turn, the aeroplane is always striving to reduce the bank and at the same time widen the turn. As a matter of fact, I find in practice that if, as we are supposing, the original tilt had been given by the action of the *ailerons*, the machine levels up just about as fast as you can return those *ailerons* to their normal position.

It is, therefore, impossible for the turn to develop into a spiral dive. Again, no matter how steep the bank, the machine will always turn so as to produce sufficient centrifugal force to give support against gravity. A sideslip is, therefore, impossible, even without calling to our aid the various devices I shall explain later when we come to deal with the purely lateral stability.

Now instead of allowing the tilted machine to spring back level, we can, by means of *ailerons*, ease the lifting and forward-thrusting pressure on the inner extremity by letting the back edge of that part fly up, and reduce the downward and backward-thrusting pressure on the outer extremity by letting the back edge of that extremity drop. In this position we have turning equilibrium. An examination of Fig. 18 will render it evident that if a gust turns the nose of the machine inward, so as to narrow the circle, we shall immediately get an increased counterbanking effect and increased resistance on the outer wing; while, if the nose be turned outward, we shall get the reverse effect. By modifying the geometrical angle of the tips, we have made the radius of turn where the machine can attain equilibrium less than infinity. If we continue to raise the inner back edge and lower the outer back edge, so as to get a definite banking and inward-turning couple, the machine will bank and turn in response until the narrowed circle again brings sufficient counterbanking effect into action to neutralise the new setting of the *ailerons*.

You will perceive from this that, in order to commence a turn, we have to put definite negative pressure on the inner *aileron* and positive pressure on the outer, but that the machine then sets itself to such a position, and turns at such a radius, that the pressure on the *ailerons* is practically nothing, as in normal flight. Throughout the steepest banks and turns, and indeed throughout every manœuvre with this machine, the *ailerons* remain almost exactly balanced; and it is only when one wants to change position *suddenly* that one has to put any realisable pressure on the levers. As a result the machine is probably the most sensitive to control in existence.

Now for the LATERAL STABILITY.

It will be obvious, from what has gone before, that we start out to tackle this problem under unusually pleasant conditions, for we have to begin with the comfortable assurance that it does not really matter to what angle the machine gets blown over—it cannot lose equilibrium, and side-slips and spiral dives are impossible. So far, therefore, as *safety* is concerned, the lateral problem has been adequately dealt with. All that we have to do is to devise some means of ensuring lateral *steadiness*.

Lateral stability devices as a rule consist of combinations of dihedral or kathedral angles or their equivalent fins. A dihedral angle exists where the wings are flexed so as to slope away from the air current; a kathedral where they slope towards that current.

A kathedral angle is dangerous because its action becomes more powerful as it yields to the gust, and so, if it is strong enough to rotate the machine at all, it may roll it clean over. This will be apparent if you look at Fig. 19, which shows a front or back view of a kathedral wing. Obviously the wing will not arrive at a position of equilibrium to the wind represented by the arrow until it has rolled completely over to the position indicated by the dotted lines, the direction of rotation being shown by the curved arrow. A dihedral angle, on the other hand, begins to lose its power the moment it yields, and reaches a position of equilibrium with a comparatively small rotation. Fig. 20 shows such a wing, and it can be seen that a rotation of a few degrees in the direction of the curved arrow will bring it to a position of equilibrium.

Now we use to commence with a dihedral angle which tends to roll the machine towards the windward side. This statement sounds absurd, so we must explain that it is a *negative* dihedral angle. To understand what I mean by this, turn to Fig. 21. It shows a front or back view of a surface which is under negative pressure—that is to say, the wind strikes it from above. If then this wind has a lateral component, as has the arrow representing the wind in the diagram, the surface will roll a few degrees in the direction of the curved arrow, and attain the position of equilibrium shown by the dotted lines. Comparing Fig. 21 with Fig. 19, we see that there is a very considerable difference between a positive kathedral and a negative dihedral, even though both cause rotation in the same direction.

This negative dihedral has all the stabilising properties of the positive dihedral, but operates in the opposite direction. If you will look back to Fig. 4a, you will see the angle in question is formed by the negative tips of the machine.*

(*To be concluded.*)

* The tips of the "Zanonia" leaf form a negative kathedral, which rolls the leaf the same way as does a positive dihedral, but lacks the stability of the latter.

Models

Edited by V. E. JOHNSON, M.A.

"The Whirling Table as an Aid to Research."

We have received the following communication from Mr. H. R. Kerruish (hon. sec. Brighton and Hove Model Aero Club): "I notice in this week's FLIGHT, Mr. G. H. Kilshaw expresses his intention of constructing a whirling table for aeronautical research. May I be permitted, through the medium of your columns, to assure Mr. Kilshaw, and any other person who thinks of taking up the idea, that the game is not worth the candle? The whirling table, a favourite instrument of research with the earlier experimenters, is an extremely inexact apparatus for quantitative work. The reason is to be found in the inevitable eddy currents set up by the rotating arm. To take a concrete example, you state at the head of your article in a recent issue, that the velocity obtainable by your apparatus was 45 m.p.h. Now at this velocity the eddy currents would have a velocity of *at least* 2 m.p.h., and if they struck the aerofoil under test (which we will suppose to be at an angle of incidence of 5°) at right-angles to its motion, it may be shown by very elementary principles of pure mechanics that its angle of incidence would be altered by approximately 2° 30′: that is to say, an error of 50 *per cent.* will be introduced. Of course, an error of that magnitude is manifestly absurd in any experiment aspiring to even moderate exactness.

"The most exact aerodynamical researches have been made with wind tunnels, but even then there are slight sources of error, such as the turbulence of the current, the difficulty of rendering the air stream parallel with the sides of the tunnel, &c.

"When a satisfactory theory of aerodynamics is evolved, factors will be introduced to correct them.

"There is another method, due to Mr. Ellis Williams, which consists in attaching the aerofoil under test to a long rigid pendulum, and noting alterations in the amplitude of its swing; and then, by the application of the mathematical theory of the pendulum, extremely accurate conclusions may be drawn. The most accurate determinations made with a whirling table were by Mr. Dines, who employed what he termed a 'centrifugal balance.' I have no time in this letter to give a full description of the apparatus, and a mathematical exposition of its action, but an account will be found in Lanchester's 'Aerodynamics,' pp. 338-346. This device necessitates the use of extremely delicate apparatus, including an electric chronograph, so that an intimate knowledge of such instruments, and much specialised work, would be necessary to construct one.

"I have personally used a modification of Mr. Williams' pendulum apparatus with great success, and I am embodying my results in a short treatise, which I may possibly communicate to FLIGHT later. Let me once more assure Mr. Kilshaw that if he builds a whirling table he will only be wasting time, materials, and money. If he cares to communicate with me I shall be pleased to describe my apparatus for him.

"In conclusion, please accept my congratulations in attempting to bring *real* research work into the flying of model aeroplanes."

Referring to Mr. Kerruish's most interesting communication in so far as it relates to the particular research work which Mr. Kilshaw proposes to carry out on a whirling table, we quite agree with our correspondent, nor do we see any way to carry them out in a really satisfactory manner save in free flight; but, when our correspondent says that Mr. Kilshaw would be wasting both his time, materials and money in the construction of a whirling table, then we can no longer agree with him. Everything depends on the kind of research work you propose to carry out.

The whirling table erected by the writer was built for the purpose of determining the body of minimum resistance *at a fairly high velocity in a turbulent medium*. The results were published in *Invention*, and one or two other papers. *These results more recent research carried out in other ways has confirmed in every way.*

Now, in real practical aerodynamics, bodies *do* move through the air *at high velocities*. Moreover, the atmosphere or air through which they move is a highly turbulent medium, full of whirls and eddies, and not a medium of uniform velocity, acceleration, &c., &c., so much beloved of theorists.

Let us assume for a moment then that Mr. Kilshaw builds a fairly large whirling table, capable of driving suitable models through the air up to a velocity of, say, 60 m.p.h.; let us also assume that Mr. Kilshaw fits it with suitable instruments for measuring the distortion, strains, &c., which the planes, struts, stays, &c., of the model are subject to at different velocities up to, say, breaking point, such instruments to include a photographic camera fitted to the arm in such a position that photographs of the planes, &c., &c., could be taken at regular intervals or when desired (by means of an electric release) showing such distortions; special apparatus, as already suggested by Mr. Kilshaw, could be fitted to the arm, by which the model could be subjected to sudden side gusts, &c. Does Mr. Kerruish still maintain that Mr. Kilshaw would be wasting both his time, money, &c.?

Full-sized machines still continue to break up in the air when subjected to sudden increases of pressure, and the resultant smash, &c., on reaching earth, apart from aught else, makes it generally impossible to tell exactly what took place up above. Surely a large field of scientific research is open in this direction, even with a whirling table—imperfect as it may be. Mr. Kerruish objects to a whirling table, but what is his long, rigid pendulum but a whirling table rocked too and fro in a vertical plane?

Many and many aeronautical experiments have been carried out with bodies moving at low velocities in a medium which is carefully made as uniform or free from eddies as possible. But what we now want to know is exactly what takes place at a high velocity in a medium which is never uniform, but always turbulent, more or less: generally more than less.

Mr. R. L. Rogers' Olympia Model.

The following are the chief particulars of this model:—*Fuselage*, 36 ins., built up with six pieces of $\frac{1}{4}$ in. by $\frac{1}{16}$ in. tapered birch. Baulks at intervals, closer at the ends, of canary wood. Bound at each baulk with thread. The whole silk covered. Maximum cross section $1\frac{1}{2}$ ins. by $\frac{3}{4}$ in., minimum $\frac{1}{2}$ in. by $\frac{1}{4}$ in. Weight of rod, $2\frac{1}{4}$ ozs.

Main Plane span, 30 ins. Average chord, 5 ins. Double surfaced—built up—cambered.

Tail Plane.—36 square inches.

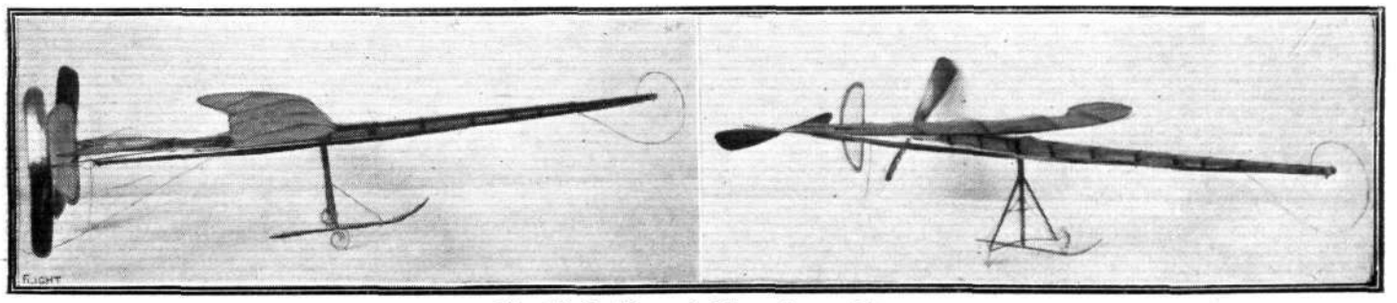
Propellers.—10 ins. diam., laminated and carved from canary wood. Pitch 30 ins.

Chassis.—Detachable from socket. Laminated birch skid.

Rubber.—Seven strands—$\frac{1}{4}$-inch strip per side. Weight $2\frac{3}{4}$ ozs. Wound with a double winder.

General Remarks.—It was the intention of the designer that the model should weigh from 9 to 10 ozs., but it came out much heavier, the loading being in consequence about $8\frac{1}{4}$ ozs. per square foot, giving no margin of lift. In flight the model was rather fast as one would expect.

The designer also states that he feels he made a mistake—as matters turned out—in having propellers of 45° pitch angle, considering that he would have done better with less pitch and rubber and more turns.



Mr. R. L. Rogers' Olympia model.

AFFILIATED MODEL CLUBS DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (N. Branch) (25, CHURCH CRESCENT, MUSWELL HILL, N.).

Monthly Report.—Members have been flying at Finchley on no less than 20 days during the past four weeks, progress on the part of those who have worked steadily through the month being in every case very marked. Prospective members should join at once, so as to get into full swing before the winter. Two indoor meetings have been held. Until further notice these meetings will be held at the "Cabin," Great North Road, opposite East Finchley Station, G.N.R. Competitions, &c.: Aug. 2nd, 11 members of the Paddington Club visited us for a return match, flying five a side duration r.o.g.; result, Paddington av. 40⅝ secs., A.M.A. av. 42⅞ secs. Aug. 4th, in contest at Burton-on-Trent for the championship of the Midlands, Mr. J. McBirnie obtained 3rd place with flight of 64 secs. On the 9th, seven members visited the Welsh Harp for R.Ae.C. contest, Mr. Weston entering. On the 16th, Messrs. Weston, Bond and Hindsley took part in the Wakefield Cup competition at Greenford. As a result of the success of the large propeller, loaded elevator machines in open competition, several members have reverted to this type. The only members retaining tails being Messrs. Bond and Hindsley. New machines have been tried at Finchley by Mr. G. Hancock, 8 oz. 1-1-0-P2, Γ section A frame; E. Coleman, 5 oz. 36 in. hollow spar, 1-1-0P2; F. Hindsley, 9 oz. hollow spar, 0-1-1-P2; S. F. Bond, 8½ oz. 42 in. hollow spar, 0-1-1-P2 (later converted to 1-1-0-P2); and C. Claplin, 38 in. hollow spar, 1-1-0-P2. The workmanship and performance of these models showed great improvement. G. O. Partridge has been trying a single-screw in Norfolk; unfortunately this went to sea, and has not yet returned. Mr. Fletcher has also been experimenting over sea at Westcliff, but wisely with floats; his machine, a 9 oz. 36 in. A frame, 1-1-0-P2, two floats front, one behind, gets off in 3 yds.

Birmingham Aero Club (8, FREDERICK ROAD, EDGBASTON).

The Club has seen some active work during the last month, especially with the glider, the machine having been repaired.

The Birmingham Aero Club glider in operation.

Bristol and West of England Aero Club (Model Section) (3, ROYAL YORK CRESCENT, CLIFTON, BRISTOL).

Monthly Report.—July 27th, members of the model section paid a visit to the gliding field at Portbury to make arrangements for a model flying competition, and find out if it would be possible to chart the air-currents on the south slope by means of models. The latter experiment proved to be abortive owing to an unfavourable wind. A flight of 61 secs. (timed by one of the official observers) was made by Mr. R. T. Howse's twin-screw "tail-type" model, terminating on top of a high and unclimbable tree. Aug. 9th and 16th, members of the committee of the Aero Club visited the field to witness gliding trials. August 23rd, members assisted at the trials of a biplane glider built by Mr. N. W. Edgar, a member of the model section. This machine was originally built to take a light engine. The dimensions are as follows:—Span, 26 ft.; length, 21 ft.; chord, 4 ft. 7 ins.; surface, 170 sq. ft. (without lower extensions); loading (with pilot on board), 2 lb. to the sq. ft. Control:—Lateral by warping the rear edge of the upper wing; longitudinal by means of an elevator flap on the fixed "floating" tail; directional by partially balanced vertical rudder. The machine has no forward elevator, and the pilot's seat is on the entering edge of the lower main plane. No satisfactory glides were made on this occasion, although the glider was off the ground several times. Some difficulty was experienced in keeping the machine on an even keel owing to a strong cross wind, and it seems to be impossible to start a glider of this type otherwise than *against* a fairly strong wind.

Croydon and District Ae.C. (158, HIGH STREET, CROYDON).

ON Sept 7th there will be a competition at Mitcham for hydros. (duration).

Monthly Report.—The Club has now shifted from its old quarters at 136A, High Street, to No. 45A, West Street, Croydon. The old workshop, though large, was hardly suitable, and the new premises are a vast improvement. Gas is laid on, and there are heating arrangements for the cold weather. There are plenty of benches and every facility which is desirable for a Club workshop. Should this catch the eye of any Croydon reader interested in model aviation, we shall be most pleased to show him over the workshop, and, if possible, enrol him as a member of the Club. The most notable performance of the month was that of Mr. Pavely's, who with an 11 oz. hydro. monoplane obtained a duration of 58 secs. He was also second in the Royal Aero Club Hydro. Competition at the Welsh Harp with a flight of 40⅞ secs. Good results have also been obtained with hydros. by Messrs. Carter, C. and H. Smither and P. Hart. With r.o.g. machines, Messrs. Carter, Finnigan, Pell, Mullins, C. and H. Smither and Hart have all had good flights. Great credit is due to Mr. W. Bell, who has made a large scale model of a "Valkyrie monoplane." The model rises from the ground nicely, and is very steady. A competition was held at Mitcham, on August 24th, for duration with r.o.g. machines. Mr. Pavely was the winner, with 60 secs, and Mr. Hart second, with 55 secs. Mr. F. Carter has made a large biplane, which flies well.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL).

SEPT. 12TH. Meeting at secretary's address.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

Monthly Report.—Members have shown great activity throughout the month in all directions. Hydros. have received considerable attention, and the club record "off water" now stands at 40 secs. by Mr. H. Bedford, with an 8 oz. model. Mr. F. Grattan's 10 oz. model has been flying on several occasions, and Mr. F. Hawthorn's hydro. has been much in evidence. In addition, two new hydros. have made their appearance; a 16 oz. biplane by Mr. H. Bedford, and a lighter monoplane by Mr. C. Herson. Most interest has been afforded by the keen competition for two silver medals, which are to be awarded to the members who put up the best duration flights between Aug. 1st and Sept. 30th. The competition is for r.o.gs. and hand-launched models, and a medal will be awarded in each class. Hitherto, very little attention has been paid to duration, and the only existing club record at the beginning of the month was 43 secs., hand-launched. To date, Messrs. C. Herson and H. Bedford have each had 87 secs.; Mr. F. Hawthorn 77 secs.; Mr. A. Hoare 63 secs.; and several other members have had flights of over 40 secs. For r.o.gs., Mr. H. Bedford leads with 65 secs., Mr. C. Herson running him close with 63 secs., Mr. F. Grattan 42 secs. Mr. H. Bond, of the North-East London Aero Club, has been flying an r.o.g. which is always good for 100 secs., and on one occasion he put up the splendid performance of 119 secs. off ground. It is hoped to announce the result of the competition in next month's report. Mr. Bond is not competing. Other members who have been obtaining good flights are Messrs. Ludlow, W. Herson, G. Pitt and A. Le Cheminant, who have confined their attention to hand-launched machines, while Messrs. T. Jack, H. Bedford and F. Grattan have been flying tractors at intervals.

N.E. London Model Ae.C. (47, JENNER RD. STOKE NEWINGTON, N.)

Monthly Report.—Work in general has been satisfactory. Mr. Burton experimenting with negative tipped wings. Mr. Bond has evolved a remarkably efficient model by careful streamlining and propeller design, obtaining 120 secs. r.o.g.; the same care seems to have been taken with a large weight-lifting single-screw (Canard). Longstaffe has greatly increased the efficiency of his models by propeller experiments. Blade shapes do not seem to affect efficiency so much as blade cambers and blade thicknesses. He has also been experimenting with a tandem monoplane. Among other members very consistent work has been done by Messrs. Lewin, Vans, Dore, Gittus and Marmin.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

Monthly Report.—Excellent progress continues to be made by members with r.o.g. models. On July 5th, an inter-club contest with Aero Models Assoc. was held in the Club's private flying ground at Sudbury. The visiting club mustered only two flyers, Messrs. F. G. Hindsley and Claflan. Messrs. A. Cannell and C. C. Dutton opposed them. The former's average duration was 39 secs. r.o.g., and the latter's 70 secs. In the return match at Finchley, on Aug. 2nd, the results were as follow: For aero models, H. Weston, 67⅝ secs.; H. Bond, 46⅛; Claflan, 45, F. Hindsley, 38; Coleman, 14⅜—average, 42⅝. For Paddington: A. Cannell, 65 secs.; C. Dutton, 42; W. Evans, 36⅛; H. Woolley, 32; T. Carter, 26¼—average, 40⅜. Mr. H. Weston flew a model kindly lent him by Mr. Cannell, which probably cost the club the match. At the Littlehampton meeting on Aug. 4th, Mr. C. C. Dutton won second prize, a silver rose bowl, with a flight of 53 secs. r.o.g. On Aug. 9th, at Sudbury, one of the club's popular r.o.g. handicaps was held, with the following result: 1st prize (3s. cash), W. Evans, 83·6 marks; 2nd prize (2s. cash), C. C. Dutton, 83·2; M. Levy, 70; R. Bird, 58, F. Johnson, 58, T. Carter, 56. On Aug. 13th, at Hendon Aerodrome, Messrs. Cannell and Dutton scored a remarkable success for the club in the London Aerodrome Challenge Trophy Competition, which was judged in an efficiency formula. Mr. A. Cannell secured the silver trophy and plaque presented by Mr. Claude Grahame-White, and Mr. C. C. Dutton won second prize, the silver medal of the K. and M.A.A. On Aug. 16th, club competition for 8-oz. r.o.g. models. Mr. T. Carter secured 1st prize with 65⅝ secs., and W. Evans 2nd prize with 52⅜. The same afternoon Messrs. Cannell and Dutton were among the competitors for the Wakefield Cup, at Greenford, and tied for third place. On Aug. 17th, at Wimbledon Common, Mr. Dutton was flying his single-screw tractor, his best hand-launched time being 60 secs. and r.o.g. 48 secs. These are good performances considering he has taken up this type of model only quite recently. In the hand-launched handicap on Aug. 23rd, Mr. D. Driver, a new member, secured 1st prize (2s. cash). On Aug. 30th, another r.o.g. duration handicap was held, when Messrs. T. Carter and F. Johnson tied for 1st prize with 85 marks. Mr. H. Woolley took 2nd prize with 81, M. Levy, 76, and R. Bird, 70⅝. At the K. and M.A.A. trials held at Finchley on the same day, Mr. C. C. Dutton went for the single-screw tractor distance records, hand-launched and r.o.g., and beat the existing records by 93 yds. and 43 yds. respectively. Club certificates (second class) were won by Messrs. T. Carter and M. Levy. Models have to be constructed throughout, including propellers, by the competitors.

Reigate, Redhill and District (THE COTTAGE, WOODLANDS AVENUE, REDHILL).

SEPT. 6TH, Raw-on Cup Competition Tractors.

Monthly Report.—During the month a good amount of work has been done both in workshop and outside. Most members working hard for forthcoming Rawson Cup competition for tractors. Several hydros. are being experimented with, but the club is handicapped by not being in possession of a boat. The club now has the use of a lathe in the workshop, and it is hoped this may be the means of bringing in members of the right kind. Mr. Key has obtained 376 yds. with a floating tail mono., and has been testing different propellers and planes on tractor. Also testing single skein of elastic tractor with unique arrangement for overcoming twist. Mr. Burghope has been out with "Olympia" Handley-Page type tractor, flying a little "tail down," but no side-slip, having good landings (one turning to the left). Swept back wings combined with Philip's entry apparently very efficient and excellent in stability, considering big pitch screw. He has also been out with 7 oz. r.o.g. mono., getting flights of over 100 ft. in height. Mr. Sutton tuning-up 4 oz. floating tail mono., also 6 oz. tractor, his hydro., 1-1-P2, getting off at third attempt; also 2½ oz. H.L. mono. in high wind on Aug. 4th. Mr. Hoyle has had 30 secs. with new 10 oz. biplane and 300 yds. Mr. Hooton has had his 7 oz. r.o.g. mono. out with the usual good results, also testing new propellers. Mr. Greenhead has been flying 7 oz. r.o.g. mono., getting over 200 yds., also 4 oz. H.L. mono., getting 350 yds. and 40 secs. and over; lost in trees on the 9th. Mr. Norton tuning-up tractors with different types of planes and propellers. Messrs. Hoyle and Norton with Sparkles on 5th.

Sheffield Aero Club (35, PENRHYN ROAD, SHEFFIELD).

Monthly Report.—Aug. 4th, members competed at Burton-on-Trent aviation meeting for the championship of the Midlands. Aug. 5th, Mr. G. Askew made splendid flight of 91 secs. duration, his distance being estimated at half a mile, landing, after having crossed the River Trent, in the hands of a constable, who politely handed it back sound to its owner. Experiments are being carried out with model gliders of large dimensions, in view of building another full-size

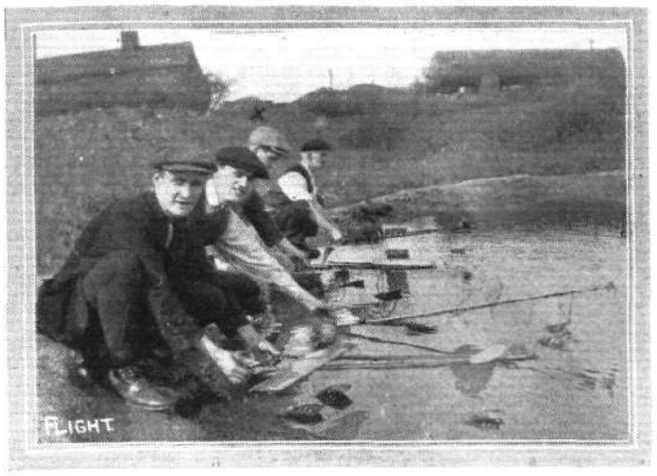


Photo by C. W. F. Cudworth.

Sheffield Aero Club contest for the President's Challenge Cup for hydro-aeroplane models, the competitors being Messrs. H. Slack, D. H. Dewsnap, W. H. Bagshaw (who raised the record to 15 secs. duration), and J. P. Worrall.

monoplane glider. Aug. 18th, general meeting, Mr. G. Askew was awarded a first class certificate for above record. Mr. Colver presented it to him on behalf of the club, and he was heartily congratulated upon being the first member of the club to gain a certificate, and raising the Sheffield record further up the list for duration, the last record being 60 secs.

Wimbledon and District (165, HOLLAND ROAD, W.).

SEPT. 6th and 7th, flying as usual.

Monthly Report.—During past month good durations have been obtained both with hand-launched and r.o.g. machines. On Aug. 10th Mr. Whitworth broke the club duration record for hand-launched machines with a fine high flight of 95 secs., which duration was repeated on the same day by Mr. Powell with a light tail model. On Aug. 17th Mr. Whitworth further raised the record to 98 secs., but this duration was eclipsed by Mr. Slatter's flight of 111 secs. on Aug. 24th. Mr. Slatter also obtained a duration of 131 secs. off ground, and both these flights were officially observed for records. Mr. Slatter's machine is of the 1-1-2P type and is a very high flyer, a fine glide being obtained. Other hand-launched machines have been flown by Messrs. Waghorn, Laing, Conolly, Eads, Whiteland, Bayliss, Rice and others. Messrs. Laing, Tucker and Hutcheon have flown r.o.g. machines averaging about 50 secs. Single-screw machines have been represented by Mr. Tucker's tractor r.o.g. and Mr. Whitworth's 1-1-1P-0 machine; this latter machine being a very high flyer, averaging about 54 secs. duration. A small competition for r.o.g. models was held Aug. 9th, Mr. Hutcheon taking 1st place with 58 secs. and Mr. Conolly 2nd with 45 secs. In the K. & M.A.A. competitions members have done well. On Bank Holiday Mr. Slatter took 2nd place at Burton with 116 marks, best duration 72 secs.; 1st in hydro. competition at Welsh Harp on Aug. 9th with 95 marks, best duration 60 secs.; 4th in London Aerodrome trophy, while on Aug. 16th he won the Wakefield cup with a fine flight of 135 secs., this constituting a club record. Mr. Pavely took second place in the hydro. competition with 82 marks, 40 secs. duration, whilst Messrs. Williams and Laing took 5th and 8th places respectively. Mr. Laing also flew well in the Wakefield competition, tying with Mr. Jannaway for 6th place.

UNAFFILIATED CLUBS.

Brighton and Hove (59, WESTBOURNE GARDENS, HOVE).

Monthly Report.—Aug. 2nd, Messrs. Barca and Kerruish flying before a large crowd on Hove Lawns. Mr. P. Barca and Mr. J. Akers have each a 9 oz. r.o.g. tractor, and an exciting contest was witnessed on the 16th, when Mr. Barca won with a flight of 26 secs. off ground to Mr. Akers' 25 secs. Mr. Barca has also been flying a Deperdussin model. Mr. Williams has been experimenting with a beautifully constructed 0-1-1-P2 H.L., and managed to obtain a flight of 49 secs., the model passing over a Simple Life camp, to the alarm of campers. His tractor biplane is still flying well. Mr. Hervey long flights with 1-1-P2-0's. Mr. Young flew a small single-screw model with velocity of 30 m.p.h. All this flying at Jack aerodrome. At Vallance aerodrome, Mr. Young flying single-screw tail-behind monoplane and Bristol mono. Mr. Barca with Dep., Mr. Kerruish high flights with ⅝ oz. 1-1-P2-0. At St. Ann's Well Mr. Kerruish gave exhibitions on 6th. At Overflow, Messrs. Young and Williams have both nearly finished bat-boats of original design. Mr. Kerruish obtained 58 secs. off ground with 1 oz. tractorplane.

Scottish Ae.S. ("ROCHELLE," LIMESIDE AVENUE, RUTHERGLEN).

Monthly Report.—The secretary regrets that owing to unforeseen circumstances no meetings have been held during this month. The committee duly appreciate Mr. Johnson's kind offer to test one of our models and give an opinion of its merits, and the secretary will arrange an impromptu competition for likely models so that the best may be sent South.

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

SEPT. 6th, Kidbrooke, 2.30 to 5.30 p.m.; Woolwich Common, 4.30 to 6.30 p.m. Sept. 7th, Blackheath, 7.30 to 10 a.m.; Lee aerodrome, 10.30 a.m. to 12.30 p.m.; Mitcham, 2.30 to 5.30 p.m.

South Eastern trophy competition. Owing to the rain it was found impossible to time the flights of all the entrants in the second round of the South Eastern Trophy competition on the date announced. Mr. Westwood, however, braved the storm, and duly passed the qualifying test. The rest of the competitors can have their flights officially timed at the Blackheath meeting on Sept. 7th. Messrs. Brown, Campbell and Jones have consented to act as judges, and the rules (published in these columns on July 26th) will be strictly enforced. Particular attention is called to Rule 15, which reads: "Competitors pushing or otherwise assisting their models to rise will be disqualified from that round, and members who commit a breach of this rule on more than one occasion will be debarred from taking further part in this competition." The present holder of the trophy (Mr. Plummer) at South Norwood ground, with his tractor, accomplished flight of 147 yds. (hand-launched). Since then a new tractor screw and main plane have been fitted. Another very promising entrant is Mr. Rippon's substantial monoplane. At Blackheath Mr. Hunt tuning-up tractor biplane (collapsible principle). Mr. Chinnery is entering "gull's wing" design mono. Messrs. Prance, Westwood, Clark, Peters and Grimstone's competition machines are all nearly completed. Mr. H. H. Groves has been rather unfortunate with his steam-driven monoplane, for one morning, after a few short preliminary flights, it side-slipped rather badly, and was temporarily put out of action. Mr. Peter's tractor monoplane is now in excellent trim, its steady realistic flying evoking unstinted admiration. In direct contrast to this model has been an r.o.g. "A" frame mono. flown by Mr. Evans, which pitches and rolls neatly. Other work by Mr. Eland with a tractor model Blériot. Mr. Westwood again flying his large tractor monoplane and also a smaller tractor surfaced with a red fabric. Mr. Brown with twin-propeller biplane, "A" frame mono. and tractor mono. (fitted with a four-bladed "Levasseur" air screw). Small racing monoplanes flown by Messrs. Clark and Jones, and Mr. Nicholl's racing biplane have all found the grounds too small. Mr. Brunton has been unfortunate with his tractor mono. on Woolwich Common, and Mr. Alwooll also on the Common, with his steady tractor monoplanes. Considerable interest was evinced when Mr. Groves brought out one of his rubber-driven bamboo biplanes. Although this particular machine had not been out for over two years, its performance was quite as good as most of the more modern machines. Extreme activity has been displayed by Mr. Chinnery with his large "gull's wing" tractor (mentioned above), and also with a smaller replica which evinces the same automatic stability. The gusty winds last week-end were very disastrous to the models. Several members have been giving exhibition flights at a new ground, Cranstone Road Fields, Forest Hill. It is the club's wish to make these fields a regular testing ground for members who reside in the vicinity. The co-operation of local aero-modellists is invited, and enquiries will be readily answered if they are sent to the hon. sec. at the above address.

Windsor Model and Gliding Club (10, ALMA RD., WINDSOR).

Monthly Report.—A great advance with both gliding and model flying has been made this month. On Aug. 2nd, in the Home Park, some extremely original models turned out, the star turn being Mr. Roger's huge tractor biplane. It climbed and flew well, doing a good hundred yards, and is altogether an enormous advance on the usual type of model. A few particulars may be of interest, although drawings, &c., will appear later. Length of *fuselage*, 5 ft.; span, 5 ft. 3 in.; total area, 666 sq. in. The total weight is 2 lbs 4 ozs. The machine is driven by 4 skeins of 14 strands ¼ in. strip, geared together, driving an 18 in. diameter propeller. The longest flight made so far is 110 yds. with 450 turns. The model when flying is a very impressive sight, and is infinitely more realistic than the small models. It is an example of what can be accomplished. As a consequence, most of the members are now building big models. On Bank Holiday, the glider was taken out for its preliminary trials. Unfortunately the ground chosen was far from ideal. Indeed, at times the machine had to be towed up an incline. The wind was also a negligible quantity. Notwithstanding these setbacks, a few towed flights were made, the one outstanding feature of them all being the remarkable lateral stability exhibited. This must be attributed to the setting of the *ailerons* at a negative angle, and here it may be observed that experiments of this kind should be more useful than the flying of minute models. It is the firm opinion of this club that if the model club movement is to really flourish, a more ambitious line must be taken, and as a result the whole movement would be raised. The club are now negotiating for a 25 h.p. Anzani, and, if this is obtained, a biplane will be built to accommodate it, and our experiments will be increased to a larger scale. The glider since Bank Holiday has undergone great improvement, a strainer now being fixed to every wire; the seating arrangement has also been altered.

CORRESPONDENCE.

Bending or Photographic Distortion.

[1783] I have read with interest your article *re* "Are These Wing Spars Bending?" I intended writing in time for this week's issue of FLIGHT, but changed my mind to see if anyone else had an explanation to offer.

A slight inaccuracy appears in your article. The wings have a considerable dihedral, and this fact, taking into consideration the angle at which the wings are set (the angle of incidence), would, no doubt, explain the whole phenomena. I have seen a print of the photograph, and noticed that there are creases in the fabric of the right wing; these creases are caused by the wing being slightly forward of its normal position. This will dispel at once the idea that the spars are bending backward. In any case they could not bend in either direction to any extent without snapping the internal bracing wires.

I hope this letter may be of interest to you.

United Service Club, August 30th. J. C. PORTE.

[1784] With reference to the interesting photograph reproduced on page 930 of your paper, we do not think that the distortion in question, if such it could be called, is due to any optical reason.

For C. P. GOERZ OPTICAL WORKS, LTD.

1 to 6, Holborn Circus, E.C. R. E. PEELING, Secretary.

Stability of Aeroplanes. Deflecting Forces.

[1785] Although automatic stability against various disturbances may be desirable of accomplishment, it would appear that a construction which would avoid automatic instability is not only more desirable, but is entirely easy of accomplishment. The automatic instability referred to is the result of the deflecting forces which are generated by the rotating masses of the engine and the propeller when the orientation of the axis of that rotation is changed, either by a sudden puff of wind or by the manipulation of the pilot in steering. In given circumstances, otherwise, the magnitude of these deflecting forces is directly proportional to the rate of change in the orientation of the axis of rotation, so that the degree of

instability may readily be doubled or quadrupled or increased manifold by the relative suddenness of the gust of wind, and it may be beyond the power of the pilot to so manipulate his machine as to prevent actual overturning. Even when he can manipulate the machine so as to prevent overturning, these deflecting forces throw sudden strains upon the framework of the aeroplane between the engine and the supporting wings, and upon the wings, or supporting planes themselves, which, as now constructed, must finally resist these deflecting forces, or break in the effort to so resist them.

Out of the conflicting evidence of eye-witnesses of the two recent army aeroplane disasters, one can readily believe that both of the aeroplane frames were wrecked, or their sustaining planes were broken, by the sudden deflecting forces thrown upon them from the rotating machinery, due to an unusually quick change in the direction of the axis of rotation of the driving mechanism; the pilot endeavouring to resist these deflecting forces by manipulation to prevent being tipped over, and thus throwing sudden strains upon the aeroplane frame and the supporting planes.

The dynamics of rotation is well understood, and mathematicians and mechanicians are as fully aware of the existence of the deflecting forces above referred to as they are of any other facts of mathematical and mechanical science. It is well known that the magnitude of these deflecting forces is proportional to the product of four factors, viz. :—

m The mass rotating ; r^2 the square of the radius of gyration ; ω, the angular velocity of such rotation ; and α, the angular velocity of change in the orientation of the axis of rotation.

It is also well known in which direction the deflecting forces will act, and that they will cause the forward part of the aeroplane to tip downward in the case of turning in one direction, and to tip upward in the case of turning in the opposite direction.

As the mass rotating is one of the factors which determines the magnitude of these deflecting forces, it will be clear that with the use of the Gnome engine, in which the cylinders rotate as well as the propeller, these deflecting forces are increased by the increased mass of rotation over what they are when driven by engines in which the cylinders do not rotate, but only the crankshaft of the engine, together with the shaft itself and the propeller. Further, when a Gnome engine of 80 h.p. or 100 h.p. is employed, instead of only a 50 h.p., it follows that the greater mass rotated in the engine cylinders themselves, to say nothing of the increased mass of the propeller, if it should be increased, will correspondingly increase the deflecting forces with the same rate of revolution of the machinery and the same rate of change of direction of its axis of rotation.

It should not therefore seem strange to one who is familiar with the forces generated in such cases that the aeroplanes in question should have been broken in the effort to resist the deflecting couples, under the conditions of flight which prevailed. The high power of the engines used and the facts of observation by onlookers that the aeroplanes changed their direction rather suddenly would point to these deflecting forces as the actual cause of the accidents.

A careful following of the various accidents in different parts of the world for the past three years leads the undersigned to believe that far more than one-half of the casualties which have occurred by men falling to the ground in aeroplanes are traceable directly to this automatic instability, which has been improperly allowed to form a feature of the construction of the propelling mechanism of the aeroplanes. It seems probable that the time is not far distant when it may be held to be just as criminal to permit servants of the public to fly with machines so constructed as it would be to place unsafe powder in the magazines of battleships—viz., powder which it is known will explode at temperatures which are sometimes reached in such magazines, since the remedy for the one danger is as simple as the remedy for the other, and it will be held to be the duty of all responsible officers to be familiar with the remedy and see that it is applied in the construction of aeroplanes for national purposes.

It is only necessary to produce the same amount of rotative effect in the opposite direction in order to have the deflecting forces above referred to counterbalanced—*i.e.*, it is only necessary to have the product $mr^2\omega$ in the opposite direction equal to that product of the driving mechanism, because the factor α would be the same for both. If the counterbalance for the rotating masses is, however, located so as to revolve about an axis parallel with that of the driving mechanism, the strains caused by one force balancing the other must be transmitted from the one parallel shaft to the other, and should not come upon the aeroplane framing—*i.e.*, both shafts should, in such case, be carried on the same rigid bedplate or frame, which can be secured to the aeroplane framing. It is, however, believed to be far better to counterbalance the rotating masses by a sufficient mass rotating in the opposite direction on the same axis as that of the driving mechanism and upon the same shaft as that driving the propeller, so that the deflecting forces may counterbalance each other through strains in that shaft only.

It is true that some additional weight is required in order to effect such counterbalance, but it is believed that the additional weight for this purpose will not be greater than the additional weight which it would be necessary to employ in order to strengthen the framing and the wings, or support the planes of the aeroplane, sufficiently to prevent their breaking in extreme cases, if such counterbalancing were not employed.

82, York Road, King's Cross. JNO. W. CLOUD.

Early Aeroplanes and the War Office.

[1786] The "Dreamer" in this week's FLIGHT alludes to my early short flights with 9 h.p. triplane at Lea Marshes. But previous to this I had experimented with a biplane at Brooklands Track, and made the first flights in England with same in June, 1908, when fitted with an eight cylinder 24 h.p. Antoinette engine.

The "Dreamer" says he does not know whether I tried to interest the War Office. Yes, I did try, and felt it a hopeless game, with discouragement all round, spending my savings on building materials, and living on a few shillings a week to prolong this experimental stage. You can imagine how I envied those who were paid a comfortable salary, and had the Government to meet their bills.

I tried to get the use of Laffan's Plain through various channels, but this was not granted.

I see Lord Tullibardine, in his letter to the Press believes the Dunne to be the first British flying machine, but I think he will find mine was the first.

If anyone will take the trouble to look through the British Patents, they will find the first patented aeroplane with an engine, as aeroplanes are known to-day, was patented by me in 1906. In this machine the pilot sits behind the engine in a streamline body.

A. V. ROE.

Miles Platting, Manchester.
August 24th, 1913.

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